EXHIBIT 1

Securities and Exchange Commission

Plaintiff

v.

Rio Tinto plc, Rio Tinto Limited, Thomas Albanese, and Guy Robert Elliott

Defendants

Expert Report of Steven Brice FCA

20 December 2019

Defs.' Ex.

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exhibitsticker.com

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1 Introduction

1.1 This report

1.1.1 I am Steven Brice, a Partner in Mazars LLP ("**Mazars**"), the UK firm of the Mazars Group. The Mazars Group is an international organisation specialising in audit, advisory, accounting and tax services, with a direct presence in 89 countries and territories drawing on the expertise of 40,000 professionals. In the UK, Mazars has approximately 140 Partners and more than 1,750 staff.

1.1.2 I have been instructed by the Securities and Exchange Commission (the "**SEC**") to prepare this report in connection with the SEC's Complaint, dated 17 October 2017[1] (the "**Complaint**"), against Rio Tinto plc, Rio Tinto Limited (collectively "**Rio Tinto**" or "**Rio Tinto Group**"), Thomas Albanese ("**Mr Albanese**") and Guy Robert Elliott ("**Mr Elliott**"). The Complaint relates to the carrying amount of a number of assets related to Rio Tinto Coal Mozambique ("**RTCM**") (the "**RTCM Assets**") in Rio Tinto's interim financial statements for the six-month financial period ended 30 June 2012 ("**Rio Tinto's 2012 Interim Financial Statements**").

1.2 My experience

1.2.1 I am the Head of Accounting Technical Services for Mazars in the UK, specialising in International Financial Reporting Standards ("**IFRS**"). I am a Fellow of the Institute of Chartered Accountants in England and Wales ("**ICAEW**") and have over 20 years of technical accounting experience. I regularly advise clients and audit teams on the application of IFRS when preparing or auditing financial information and am routinely instructed to review financial statements for compliance with IFRS. I hold a current Practising Certificate and have Responsible Individual status for audit work within Mazars which means that I can take responsibility for audit work and sign audit reports.

1.2.2 I am routinely engaged as an expert accountant to consider matters involving the accounting treatment of particular transactions under various accounting frameworks and I have provided independent expert evidence under a number of different forums, including in the High Court

[1] Pursuant to the Court's Order of 9 December 2019, I reserve the right to supplement or revise this report if the SEC's Motion to Amend is granted

of England and Wales and the International Dispute Resolution Centre in London. As part of my IFRS advisory role I have undertaken a number of advisory assignments concerning impairment reviews and also undertake Purchase Price Allocation ("**PPA**") work.

1.2.3 Further details of my qualifications and experience are set out in my curriculum vitae at **Appendix A**, including a list of publications that I have authored and a listing of the matters in which I have testified as an expert at trial or by deposition.

1.3 Background to this report and my instructions

1.3.1 On 8 April 2011, Rio Tinto acquired a controlling interest of 52.6% in the shares of Riversdale Mining Limited ("**Riversdale**"). By 1 August 2011, Rio Tinto had increased its interest in Riversdale to 100% and had renamed Riversdale to be Rio Tinto Coal Mozambique (RTCM). The total consideration for Riversdale was US$4,168 million (excluding cash on acquisition)[2]. I refer to Rio Tinto's acquisition of Riversdale as the "**Transaction**".

1.3.2 At acquisition, the RTCM Assets were principally comprised of[3]:

(a) "**Benga**", a joint venture ("**JV**") between Riversdale (65%) and Tata Steel Limited (35%);

(b) "**Zambeze**", a tenement located adjacent to Benga;

(c) "**Tete East**", a tenement located adjacent to Benga; and

(d) a deferred tax liability and related goodwill.

1.3.3 On 17 January 2013, Rio Tinto announced that it was going to recognise an impairment of approximately US$3 billion relating to RTCM[4]. This was recognised in Rio Tinto's financial statements for the financial year ended 31 December 2012 ("**Rio Tinto's 2012 Annual Financial Statements**").

[2] Rio Tinto's annual financial statements for the financial year ended 31 December 2011 ("**Rio Tinto's 2011 Annual Financial Statements**"), Acquisitions and divestments, page 40

[3] Internal memo, titled "*Rio Tinto Coal Mozambique Impairment Valuation – Update*", dated 11 January 2013 [RT_00257820 to RT_00257836]; paragraph 4.3.15

[4] Rio Tinto's media release, 17 January 2013 "*Rio Tinto impairments and management changes*"; Rio Tinto's 2012 Annual Financial Statements, Financial review, page 36

1.3.4 I am instructed to review the available evidence and:

(a) to review and opine on the accounting standards applicable to Rio Tinto during the relevant period, as they relate to the preparation of interim financial statements and the review of assets for impairment;

(b) to consider whether, on the basis of the information available to Rio Tinto by 8 August 2012[5] (the "**Material Reporting Period**"), Rio Tinto should have undertaken an impairment test[6] in relation to the RTCM Assets before it published its 2012 Interim Financial Statements[7]; and

(c) to explain what work I would have expected to have been undertaken by Rio Tinto if such an impairment test had been carried out.

1.4 The structure of this report

1.4.1 In order to address my instructions, my report is structured as follows:

(a) in **Section 2** I provide a brief summary of my conclusions;

(b) in **Section 3** I refer in overview to the regulatory and financial reporting framework that is relevant to Rio Tinto;

(c) in **Section 4** I provide an overview of the manner in which Rio Tinto accounted for the RTCM Assets;

(d) in **Section 5** I set out the relevant financial reporting requirements in respect of when an impairment test should be undertaken;

(e) in **Sections 6 to 8** I set out the significant events which took place during the Material Reporting Period relating to:

(i) the reserves and resources at RTCM (**Section 6**);

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[5] The date of approval of Rio Tinto's 2012 Interim Financial Statements

[6] An impairment test is a test to determine whether an asset's value is less than the value (carrying amount) reflected in the company's balance sheet

[7] For purposes of this report, I have been asked not to consider the propriety of any accounting decisions that were made in connection with Rio Tinto's 2011 Annual Financial Statements

(ii) the infrastructure required for the coal chain[8] (**Section 7**); and

(iii) the expected economic performance of the RTCM Assets (**Section 8**);

(f) in **Section 9** I consider whether Rio Tinto should have undertaken an impairment test in relation to the RTCM Assets before it published its 2012 Interim Financial Statements;

(g) in **Section 10** I:

(i) consider the scope of the work of PricewaterhouseCoopers ("**PwC**") in connection with Rio Tinto's 2012 Interim Financial Statements and the requirements relating to the provision of information to an entity's auditor for the purposes of a review of interim financial statements[9]; and

(ii) provide an overview of the relevant information that I would expect to be provided to an auditor for the purposes of an interim review involving the consideration of the carrying amount of material assets and consider this in the context of PwC's work in relation to the carrying amount of RTCM as at 30 June 2012; and

(h) in **Section 11** I set out the relevant financial reporting requirements in respect of how an impairment test is required to be undertaken.

1.4.2 I have also set out a glossary of the key terms and individuals referred to in this report at **Appendix B**.

1.5 The work of Mr Drewe

1.5.1 One of my fellow Partners at Mazars, Christopher Drewe ("**Mr Drewe**") has also been instructed by the SEC in respect of the Complaint. Mr Drewe has produced a report dated

[8] "**Coal chain**" refers to the logistics options for the transport of coal from the relevant mines to the coast for export

[9] For the purposes of this consideration, I have provided certain comparisons with the scope of PwC's work in relation to Rio Tinto's 2011 Annual Financial Statements and the related requirements relating to the provision of information to an auditor

20 December 2019 ("**Drewe 1**"). In Drewe 1, Mr Drewe was instructed, based on the available evidence, to address the following question:

If Rio Tinto had undertaken an impairment test in relation to RTCM as at the 30 June 2012, would it have led to a material impairment?

1.5.2 Mr Drewe and I were also instructed by the Financial Conduct Authority in the UK (the "**FCA**")[10] in the context of its investigation into Rio Tinto's 2012 Interim Financial Statements. In that investigation, my work focussed on the financial reporting aspects relevant to the FCA's enquires.

1.6 The available information

1.6.1 The conclusions in my report are based on my experience and on the evidence provided to me. If further evidence becomes available to me, these conclusions may change.

1.6.2 In my report, where I have cited contemporaneous information and transcripts of witness interviews or depositions, I have included these in order to set out my understanding of the facts and circumstances that existed in the relevant period which are of particular relevance to my work. For example, I have referred to information that was shared internally within Rio Tinto which, in my experience, would be relevant to the consideration of whether an impairment test should be undertaken. I am not opining on whether the assertions in these documents and transcripts are true.

1.6.3 I set out at **Appendix C** a list of the information that I have relied upon in the preparation of this report. For the purposes of both my work and the work of Mr Drewe, the SEC provided Mazars with a significant number of documents, including the pleadings, interview and deposition transcripts and the documents provided to the SEC by various parties as part of the disclosure process. In total, we have been provided with approximately 150,000 documents, the significant majority of which are the documents provided as part of the disclosure process.

1.6.4 In light of the significant volume of disclosed documents, Mr Drewe and I have used an eDiscovery platform to undertake targeted searches and reviews, aimed at identifying the documents of relevance to our respective instructions. In total, we have reviewed in excess

[10] The FCA is the conduct regulator for financial markets and financial services firms in the UK

of 15,000 documents. I have shown the sources of the information I have relied upon in the footnotes of this report.

1.7 The scope of this report

1.7.1 It should be noted that the work I have completed does not constitute an audit and, other than as expressly set out in this report, I have not verified or in any other way checked the information set out in the documents I have reviewed.

1.7.2 In completing my work, I have been assisted by individuals within the Forensic and Investigation Services team and Accounting Technical Services team at Mazars. I have supervised and reviewed their work and I confirm that the opinions expressed in this report are my own.

1.7.3 Mazars' fees for this engagement are not contingent on the outcome of these proceedings. Mazars is being compensated at a rate of US$665 per hour for my time and between US$230 and US$549 per hour for staff working under my direction.

1.7.4 I have prepared this report solely for the use in these proceedings. It is confidential in all respects other than to be made available to the SEC, Rio Tinto, Mr Albanese and Mr Elliott, their legal advisors and experts and the Court.

1.7.5 This report should not be used, reproduced or circulated for any other purpose without my prior written consent. Mazars accepts no responsibility to third parties in relation to the matters in this report and / or for any breaches of this obligation.

1.7.6 Some figures in this report have been rounded and as a result some totals may include rounding differences.

2 Summary of conclusions

2.1.1 On 8 April 2011, Rio Tinto acquired a controlling interest of 52.6% in the shares of Riversdale Mining Limited (Riversdale). By 1 August 2011, Rio Tinto had increased its interest in Riversdale to 100% and had renamed Riversdale to be Rio Tinto Coal Mozambique (RTCM). The total consideration for Riversdale was US$4,168 million.

2.1.2 On 17 January 2013, Rio Tinto announced that it was going to recognise an impairment of approximately US$3 billion relating to RTCM. This was ultimately recognised in Rio Tinto's financial statements for the year ended 31 December 2012.

2.1.3 I have been instructed by the Securities and Exchange Commission to prepare this report. Specifically, I have been instructed to review the available evidence and:

(a) to review and opine on the accounting standards applicable to Rio Tinto during the relevant period, as they relate to the preparation of interim financial statements and the review of assets for impairment;

(b) to consider whether, on the basis of the information available to Rio Tinto during the relevant period, Rio Tinto should have undertaken an impairment test in relation to the RTCM Assets before it published its financial statements for the half-year ended 30 June 2012 (2012 Interim Financial Statements)[11]; and

(c) to explain what work I would expect to have been undertaken by Rio Tinto if such an impairment test had been carried out.

2.1.4 An impairment test is a quantitative test which compares the "*recoverable amount*" of an asset or cash-generating unit (CGU) with the "*carrying amount*" at which the asset or CGU is recognised in the financial statements of the entity. The relevant requirements of IFRS in respect of testing for impairment are dependent upon the particular asset in question. In summary:

[11] For purposes of this report, I have been asked not to consider the propriety of any accounting decisions that were made in connection with Rio Tinto's 2011 Annual Financial Statements

(a) goodwill: goodwill should be tested for impairment annually, irrespective of whether there are indicators of impairment. If an entity performs the mandatory annual impairment test prior to the reporting date, it must separately consider at the reporting date if there is an indicator that the goodwill may be impaired and, if there is, perform another impairment test;

(b) exploration and evaluation assets (E&E Assets): the assets should be tested for impairment if there is an indication that they are impaired. The impairment indicator requirements relating to these assets are stricter than those relating to goodwill, for example, they require "*sufficient data*" to exist to indicate that the carrying amount of an E&E Asset is unlikely to be recovered in full; and

(c) investments in equity accounted units: the investments should be tested for impairment if there is objective evidence (i.e. an indicator) of impairment. An impairment should be recognised if a "*loss event*" has occurred and that loss event impacts estimated future cash flows.

2.1.5 The above IFRS requirements apply to Rio Tinto's 2012 Interim Financial Statements.

Should Rio Tinto have undertaken an impairment test in relation to the RTCM Assets before it published its 2012 Interim Financial Statements?

2.1.6 In light of the IFRS requirements and my assumptions in relation to the significant events that took place by 8 August 2012, review of the available evidence, in my opinion, Rio Tinto should have undertaken an impairment test in relation to the RTCM Assets before it published its 2012 Interim Financial Statements because there were indicators of impairment / loss events in relation to the goodwill, the Benga equity accounted unit and the Zambeze E&E Asset. For example, I have assumed that, by 30 June 2012, Rio Tinto had:

(a) recognised a significant downgrade to the reserves and resources of the mineral properties at RTCM;

(b) experienced a number of fundamental issues relating to the infrastructure required for the coal chain. For example, I have assumed that:

(i) the barging transportation option had been rejected by the Government of Mozambique and was no longer being pursued by Rio Tinto. Rio Tinto ultimately stated that this resulted in "*a significant loss in overall potential business value*";

(ii) Rio Tinto was pursuing the Greenfield Line as the sole long-term transportation solution, with the required capital expenditure estimated to be in the region of US$5 billion to US$10 billion. Whilst Rio Tinto had begun searching for a funding partner, no agreement had been made by 30 June 2012;

(iii) Rio Tinto's estimates of the required capital expenditure and operating costs in relation to the coal chain had increased; and

(iv) Rio Tinto had identified that the coal chain infrastructure would be a constraint on the quantum of saleable coal and would therefore defer certain cash flows in relation to RTCM; and

(c) generated assessments of the value of the RTCM Assets which indicated, for example, that the economic performance of the RTCM Assets would be worse than previously estimated and had even computed a negative net present value for RTCM in May 2012.

2.1.7 With regard to the 2012 Interim Financial Statements, Rio Tinto has referred to "*uncertainties about transportation*" but states that "*there was not a sufficient basis to conclude that there was an impairment indicator*". In addition, Rio Tinto has referred to a number of factors which it claims could have mitigated to a certain extent the impact of a decline in the assessed fair value of the RTCM Assets arising as a result of the development of an alternative transport option. However:

(a) the relevant provisions of IFRS do not refer to the existence of uncertainty being a permissible reason for delaying or avoiding an impairment test. In my opinion, an impairment test should be undertaken even if, as a result of uncertainty, it is only possible to undertake the test using a number of best estimates as inputs or on a risk-weighted basis to reflect the level of uncertainty; and

(b) the existence of mitigating factors could ultimately mean that an entity is not required to recognise an impairment, despite the existence of indicators of impairment. However, in order for the entity to conclude in this regard it is necessary for the entity to undertake the impairment test. The purpose of an impairment test is to determine whether or not there is an impairment and, if there is, to quantify it. Importantly, it is not the purpose of an impairment test to quantify only the amount of known impairments.

The work I would expect to have been undertaken if an impairment test had been carried out

2.1.8 When the impairment of the RTCM Assets was ultimately recognised in Rio Tinto's 2012 Annual Financial Statements, the recoverable amount of the RTCM CGU was assessed by reference to the fair value less costs to sell (FVLCS). This was derived from an analysis of the net present value of expected future cash flows (often referred to as discounted cash flow analysis).

2.1.9 Rio Tinto's use of the FVLCS approach based on discounted cash flow analysis is consistent with my experience of recoverable amount assessments undertaken by other entities and is consistent with Rio Tinto's stated accounting policy in its 2011 and 2012 Annual Financial Statements. I consider it reasonable to assume that, had Rio Tinto undertaken an impairment test prior to the issuance of its 2012 Interim Financial Statements, the recoverable amount would have been assessed using this approach.

2.1.10 It is not unusual for entities to be faced with the existence of uncertainty when undertaking an impairment test. However, as referred to above, an impairment test should still be undertaken when it is required even if, as a result of uncertainty, it is only possible to undertake the test using a number of best estimates as inputs or on a risk-weighted basis to reflect the level of uncertainty. In my experience, it is possible for entities to undertake an impairment test using reasonable assumptions despite facing uncertainty. Had Rio Tinto undertaken the impairment tests, these approaches should have been adopted by reference to Rio Tinto's contemporaneous discounted cash flow analysis and its knowledge of the significant post-acquisition events that had taken place.

3 The regulatory and financial reporting framework

3.1 Introduction

3.1.1 In order to consider whether Rio Tinto should have undertaken an impairment test, it is first necessary to explain the financial reporting framework and rules that governed the preparation and publication of Rio Tinto's financial statements. In this Section I therefore consider:

(a) the statutory and regulatory reporting requirements applicable to Rio Tinto;

(b) the financial reporting framework; and

(c) Rio Tinto's Controller's Manual.

3.2 The statutory and regulatory framework

3.2.1 During the Material Reporting Period the Rio Tinto Group included Rio Tinto plc and Rio Tinto Limited. Rio Tinto plc is registered in England and Wales and is listed on the London Stock Exchange[12]. In addition, during the Material Reporting Period it had a sponsored American Depository Receipt facility, with underlying shares registered with the SEC and listed on the New York Stock Exchange[13]. Rio Tinto Limited is registered in Australia and listed on the Australian Securities Exchange ("**ASX**")[14].

3.2.2 As such, Rio Tinto had to comply with the relevant requirements of the following:

(a) the UK Companies Act 2006 (the "**Companies Act**") and the Financial Services and Markets Act 2000 (the "**FSMA**");

(b) the Australian Corporations Act 2001 (the "**Corporations Act**") and the "**ASX Listing Rules**"; and

[12] Rio Tinto's 2011 Annual Financial Statements, Shareholder information, page 119; Rio Tinto's 2012 Annual Financial Statements, Shareholder information, page 127
[13] Rio Tinto's 2011 Annual Financial Statements, Shareholder information, page 121; Rio Tinto's 2012 Annual Financial Statements, Shareholder information, page 129
[14] Rio Tinto's 2011 Annual Financial Statements, Shareholder information, page 119; Rio Tinto's 2012 Annual Financial Statements, Shareholder information, page 127

(c) the US Securities Act of 1933 (the "**Securities Act**") and the Securities Exchange Act of 1934 (the "**Exchange Act**") (together, "**US Federal Securities Law**").

The Companies Act

3.2.3 The Companies Act sets out the particular requirements for a company's accounting records and the preparation and audit of a company's annual accounts, most commonly known as statutory accounts. It confirms that directors of a company must not approve accounts unless they are satisfied that those accounts give a true and fair[15] view of the assets, liabilities, financial position and profit or loss[16].

FSMA

3.2.4 The FSMA established the Financial Services Authority ("**FSA**") as the UK regulator[17] of insurance, investment business and banking.

3.2.5 The FSMA sets out particular rules in respect of disclosure and transparency of financial information ("**DTR**")[18], including the requirements to publish an annual financial report and to take all reasonable care in this regard[19].

3.2.6 In relation to groups of companies, the DTR provide that the audited financial statements must be prepared in accordance with IFRS[20].

3.2.7 Furthermore, in relation to interim accounts, the DTR provide that an issuer must make public a half-yearly financial report covering the first six months of the financial year[21] and that the accounting policies and presentation applied to interim figures should be consistent with those applied in the latest published annual accounts[22].

[15] There is no statutory definition of true and fair, but it is generally accepted that it means compliance with accounting standards which, in Rio Tinto's case, were IFRS (https://www.frc.org.uk/accountants/accounting-and-reporting-policy/true-and-fair-concept)
[16] Companies Act 2006, Section 393
[17] FSMA, provisions 1 and 2
[18] DTR rules form part of Part 6 of Section 73A of the FSMA
[19] FSA Handbook (as at 30 June 2012), Disclosure and Transparency Rules, article 1.3.4
[20] FSA Handbook (as at 30 June 2012), Disclosure and Transparency Rules, article 4.1.6 (1)
[21] FSA Handbook (as at 30 June 2012), Disclosure and Transparency Rules, article 4.2.2 (1)
[22] FSA Handbook (as at 30 June 2012), Disclosure and Transparency Rules, article 4.2.6

Corporations Act

3.2.8 Similar to the UK Companies Act, the Australian Corporations Act sets out the particular requirements for a company's accounting records and the preparation and audit of a company's annual accounts.

ASX Listing Rules

3.2.9 The listing rules of the ASX govern, *inter alia*, the disclosure required from listed entities and some aspects of a listed entity's conduct[23].

3.2.10 Of particular relevance to entities operating in the mining industry, the ASX Listing Rules require that all listed companies follow the requirements of the "**JORC Code**"[24] for the public reporting of reserves and resources[25].

3.2.11 The JORC Code sets out the "*minimum standards, recommendations and guidelines for Public Reporting in Australasia of Exploration Results, Mineral Resources and Ore Reserves*"[26]. In this regard, public reports are reports "*on Exploration Results, Mineral Resources or Ore Reserves, prepared for the purpose of informing investors or potential investors and their advisers.* […] *Public Reports include but are not limited to: company annual reports, quarterly reports and other reports to Australian and New Zealand Stock Exchanges, or as required by law. The Code applies to other publicly released company information in the form of postings on company web sites and briefings for shareholders, stockbrokers and investment analysts*"[27].

3.2.12 The JORC Code requires that companies review and publish their reserves and resources at least annually[28].

[23] ASX Listing Rules, Introduction
[24] ASX Listing Rules, Chapter 5. The JORC Code is the Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves issued by the Joint Ore Reserves Committee. The 2004 Edition of the JORC Code was superseded by the 2012 Edition of the JORC Code, which was effective from 20 December 2012 and mandatory from 1 December 2013. I refer only to the 2004 Edition of the JORC Code in this report as this is the version that was applicable during the Material Reporting Period
[25] JORC Code, clause 3, page 2
[26] JORC Code, clause 1, page 2
[27] JORC Code, clause 5, page 3
[28] JORC Code, clause 14, page 6

US Federal Securities Law[29]

3.2.13 Foreign private issuers which have securities registered with the SEC are required to file annual financial statements on Form 20-F which, of relevance to entities operating in the mining industry, are to include information about reserves. Foreign private issuers meet certain of their other reporting obligations by furnishing reports on Form 6-K. The Form 6-K is used for interim financial statements.

3.2.14 Those financial statements may be prepared pursuant to US generally accepted accounting principles ("**US GAAP**"), IFRS as issued by the International Accounting Standards Board ("**IASB**"), or home country accounting standards with a reconciliation to US GAAP.

3.3 The financial reporting framework

3.3.1 Rio Tinto's 2011 Annual Financial Statements and 2012 Annual Financial Statements state that they were prepared in accordance with IFRS as adopted by the European Union. Rio Tinto's 2012 Interim Financial Statements state that they were prepared in accordance with IAS 34[30] which confirms that, when preparing interim financial statements, an entity shall apply the same accounting policies as for its annual financial statements[31].

3.3.2 IFRS are principles-based standards issued by the IASB, or its predecessor, the International Accounting Standards Committee ("**IASC**"). They comprise:

(a) International Accounting Standards ("**IAS**"), being the Standards issued by the IASC and adopted by the IASB;

(b) IFRSs, being the Standards issued by the IASB; and

(c) interpretations developed by the International Financial Reporting Interpretations Committee or the former Standing Interpretations Committee (being "**IFRIC**" or "**SIC**" respectively).

[29] https://www.sec.gov/divisions/corpfin/internatl/foreign-private-issuers-overview.shtml#III (as at 1 November 2019)
[30] Rio Tinto's 2012 Interim Financial Statements, page 40
[31] IAS 34, IN7 (**Exhibit A**)

3.3.3 The principal Standards relevant to this report are[32]:

(a) IFRS 3 "*Business Combinations*" ("**IFRS 3**");

(b) IFRS 6 "*Exploration for and Evaluation of Mineral Resources*" ("**IFRS 6**");

(c) IAS 10 "*Events after the Reporting Period*" ("**IAS 10**");

(d) IAS 12 "*Income Taxes*" ("**IAS 12**");

(e) IAS 28 "*Investments in Associates*" ("**IAS 28**");

(f) IAS 31 "*Interests in Joint Ventures*" ("**IAS 31**");

(g) IAS 34 "*Interim Financial Reporting*" ("**IAS 34**");

(h) IAS 36 "*Impairment of Assets*" ("**IAS 36**"); and

(i) IAS 39 "*Financial Instruments: Recognition and Measurement*" ("**IAS 39**").

3.3.4 In addition, reference should also be made to the Conceptual Framework for Financial Reporting (the "**Conceptual Framework**"). This was issued by the IASB in September 2010 and superseded the Framework for the Preparation and Presentation of Financial Statements issued in 1989 by the IASB's predecessor, the IASC.

3.3.5 The Conceptual Framework is not a Standard and hence does not define standards for any particular measurement or disclosure issue. However, the Conceptual Framework sets out "*the concepts that underlie the preparation and presentation of financial statements for external users*"[33]. It serves as a guide to the IASB in developing future Standards and a guide to resolving accounting issues that are not addressed directly elsewhere in the Standards. It also usefully describes qualitative characteristics of financial information, and introduces the concepts of relevance (including materiality) and faithful representation (which I refer to later in Section 9.5)[34].

[32] The Standards relevant to this report are the official pronouncements that were applicable during the Material Reporting Period. I comment on each of these standards further where relevant in this report
[33] Purpose and status section of the Conceptual Framework (**Exhibit B**)
[34] Conceptual Framework, paragraphs QC3, QC11 and QC12 (**Exhibit B**)

3.4 The Controller's Manual

3.4.1 The individuals responsible for financial reporting at Rio Tinto were known as the "**Controllers**" within Rio Tinto. The Controllers were responsible for[35]:

(a) external reporting, including ensuring the reporting was in accordance with the relevant financial reporting framework;

(b) the planning and budget process;

(c) internal reporting and management accounts; and

(d) ensuring Rio Tinto's processes and controls were in compliance with the relevant regulations.

3.4.2 The Controllers regulated a compilation of policies and procedures that were documented in a manual called the "**Controller's Manual**"[36] which was placed on an internal Rio Tinto portal to provide a "*convenient point of access for Business Units*"[37].

3.4.3 The Controller's Manual was described by Laura Barbrook, Deputy Controller, RTHQ ("**Ms Barbrook**") as an "*electronic Word document that describes and gives further guidance on each IFRS standard and how that might be applied in practice within the mining company, particularly Rio Tinto*"[38]. The stated objective of the Controller's Manual was to provide the Business Units of Rio Tinto with "*statements of practice*"[39] rather than to provide a "*wide ranging description of best practice in financial administration or International Financial Reporting Standards*"[40].

3.4.4 The Controller's Manual requires that:

"*financial information provided to Controllers by Business Units should be drawn up in accordance with the Rio Tinto Group Accounting Policies which are set out in the notes to*

[35] Transcript of the SEC's interview with Ms Barbrook on 4 November 2015, page 18
[36] The Controller's Manual referred to in this report is the version dated 30 May 2007 which I understand was the version extant during the Material Reporting Period
[37] Controller's Manual, Introduction, paragraph 1.1
[38] Transcript of the SEC's interview with Ms Barbrook on 4 November 2015, page 20
[39] Controller's Manual, Introduction, paragraph 1.2
[40] Controller's Manual, Introduction, paragraph 1.2

the Group financial statements; and which in some cases are elaborated on in this manual. These policies are based on IFRS"[41]; and

"*Business Unit financial management have a general responsibility to maintain high standards of financial control; efficient financial administration; and financial reporting which gives a true and fair view of the affairs of the Business Unit*"[42].

3.4.5 The Controller's Manual is divided into sections which contain guidance on the accounting treatment of specific components of the income statement and balance sheet with each also referring to the appropriate accounting treatment under IFRS. The key sections of the Controller's Manual relevant to this report are:

(a) "*C110 Intangible assets*";

(b) "*C120 Exploration and Evaluation Costs*";

(c) "*C180 Joint Ventures*";

(d) "*C350 Interim (Half Year) Accounts*";

(e) "*C360 Impairment of non-current assets*"; and

(f) "*E6 Reporting of Accounting Issues*".

3.4.6 I will refer to the provisions of the Controller's Manual where relevant in the remainder of this report.

[41] Controller's Manual, Introduction, paragraph 1.6
[42] Controller's Manual, Introduction, paragraph 1.3

4 The manner in which Rio Tinto accounted for the RTCM Assets

4.1 Introduction

4.1.1 In this Section I comment on how Rio Tinto accounted for the RTCM Assets. In doing so I:

(a) set out the relevant requirements of IFRS (**Section 4.2**);

(b) consider Rio Tinto's contemporaneous reporting of the Transaction and initial assessment of the carrying amount of the RTCM Assets (**Section 4.3**); and

(c) identify the carrying amount of the RTCM cash-generating unit ("**CGU**")[43] recorded subsequent to the Transaction (in particular in Rio Tinto's 2012 Interim and Annual Financial Statements) (**Section 4.4**).

4.2 The relevant requirements of IFRS

Accounting for a business combination

4.2.1 IFRS 3 explains that a business combination is a transaction or other event in which an acquirer obtains control of one or more businesses[44]. IFRS 3 provides that an entity shall account for a business combination by applying the acquisition method[45].

4.2.2 In applying the acquisition method, it is necessary to recognise and measure the identifiable assets acquired, the liabilities assumed and any non-controlling interests[46] in the acquiree[47]. This process, which is explained in paragraphs 10 to 31 of IFRS 3, is typically referred to as the "purchase price allocation" or "PPA".

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[43] A cash-generating unit, or "CGU", is "*the smallest identifiable group of assets that generates cash inflows that are largely independent of the cash inflows from other assets or group of assets*", as confirmed by paragraph 6 of IAS 36 (**Exhibit C**)

[44] IFRS 3, Appendix A, Defined terms (**Exhibit D**)

[45] IFRS 3, paragraph 4 (**Exhibit D**)

[46] Being "*The equity in a subsidiary not attributable, directly or indirectly, to a parent*" (IFRS 3, Appendix A, Defined terms (**Exhibit D**))

[47] IFRS 3, paragraph 5 (**Exhibit D**)

4.2.3 The assets and liabilities are recorded at their fair value[48] at the date of acquisition[49]. To the extent that the purchase price (or total consideration)[50] exceeds the fair value of assets and liabilities, an asset referred to as "Goodwill" is recognised. Goodwill is an estimate of the future economic benefits that arise from assets acquired that are neither individually identified nor separately recognised[51].

4.2.4 The acquirer has twelve months to finalise the fair value of the assets acquired and liabilities assumed at the acquisition date, together with the resulting amount of goodwill arising from the business combination[52].

The relevant categories of assets acquired and liabilities assumed

4.2.5 As a result of the Transaction, the principal categories of assets and liabilities acquired and assumed by Rio Tinto in the Transaction (being the RTCM Assets) and therefore relevant to this report are:

(a) mining assets;

(b) investments in equity accounted units; and

(c) deferred tax liabilities and goodwill.

4.2.6 I discuss the relevant financial reporting requirements for these categories of assets and liabilities in turn below:

<u>Mining assets</u>

4.2.7 In order to identify the relevant Standard and thus financial reporting requirements of a mining asset, it is necessary to consider the stage of production that is most applicable to the acquired assets. In this regard, there are five principal stages in a mining life cycle:

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[48] Being "*The amount for which an asset could be exchanged, or a liability settled, between knowledgeable, willing parties in an arm's length transaction*" (IFRS 3, Appendix A, Defined terms) (**Exhibit D**)
[49] IFRS 3, paragraph 19 (**Exhibit D**)
[50] IFRS 3, paragraph 32 (**Exhibit D**)
[51] IFRS 3, Appendix A, Defined terms (**Exhibit D**)
[52] IFRS 3, paragraph 45 (**Exhibit D**)

(a) exploration, which is the search for resources suitable for commercial exploitation and with economic potential[53];

(b) evaluation, which is the determination of the technical feasibility and commercial viability of a mineral resource from a detailed assessment of deposits or other projects[54];

(c) development, which is the establishment of access to and commissioning of facilities to extract, treat and transport production from the mineral reserve;

(d) production, which is the activity of obtaining saleable product from the mineral reserve on a commercial scale; and

(e) closure and rehabilitation, which is after mining operations have ceased and includes restoration and rehabilitation of the site[55].

4.2.8 The Standards which are relevant to mining assets and / or expenditure in each of the above stages of the mining life cycle are as follows:

(a) exploration or evaluation stage: the mining assets and expenditure are accounted for in accordance with IFRS 6;

(b) development stage[56]: an entity should develop its own accounting policy following IAS 8[57] guidance on accounting policies and based upon the provisions of IAS 16 "*Property, Plant and Equipment*" ("**IAS 16**"), IAS 38 "*Intangible Assets*" ("**IAS 38**") and the Conceptual Framework; and

(c) production stage onwards: expenditure should only be capitalised if it meets the asset recognition criteria in IAS 16 or IAS 38.

[53] Controller's Manual (C120 Exploration and Evaluation Costs), paragraph 1.1
[54] Controller's Manual (C120 Exploration and Evaluation Costs), paragraph 1.1
[55] Controller's Manual (C220 Closedown Restoration and Clean up Costs), paragraph 1.2
[56] Rio Tinto accounted for development expenditure once commercially viable under "*mining properties and leases*", a component of "*Property, Plant and Equipment*". Rio Tinto's 2011 Annual Financial Statements, page 141
[57] IAS 8 "*Accounting Policies, Changes in Accounting Estimates and Errors*" ("**IAS 8**") sets out the criteria for selecting and changing accounting policies, as well as the accounting treatment and disclosure of changes in accounting policies, accounting estimates and corrections of errors

Investments in equity accounted units

4.2.9 According to IAS 31 a JV is "*a contractual arrangement whereby two or more parties undertake an economic activity that is subject to joint control*"[58].

4.2.10 The Controller's Manual provides a definition of a JV specific to Rio Tinto as follows:

"*A joint venture is a contractual arrangement whereby two or more parties undertake an economic activity that is subject to joint control. Joint control is the contractually agreed sharing of control such that significant operating and financial decisions require the unanimous consent of the parties sharing control. In some situations, joint control exists even though the Group has an ownership interest of more than 50 per cent because of the veto rights held by joint venture partners*"[59].

4.2.11 Pursuant to IAS 31, an entity with an interest in a JV has a choice as to how the JV is accounted for. Of relevance to this report is the use of the "*equity method*" which is explained in paragraphs 38 to 41 of IAS 31. Other methods permissible under IAS 31, including "*proportionate consolidation*", are not relevant to my report.

4.2.12 The Controller's Manual explains when the equity method should be used:

"*The Group has two types of joint ventures:*

1.2.1 Jointly controlled entities ('JCEs'): A JCE is a joint venture that involves the establishment of a corporation, partnership or other entity in which each venturer has a long term interest. JCEs are accounted for using the equity accounting method.

1.2.2 Jointly controlled assets ('JCAs'): JCAs do not involve the establishment of a corporation, partnership or other entity. A JCA is a joint venture in which the venturers have joint control over the assets contributed to or acquired for the purposes of the joint venture. This includes situations where the participants benefit from the jointly [sic] *activity through a share of the production, rather than by receiving a share of the results of trading. The Group's proportionate interest in the assets, liabilities, revenues, expenses and cash flows of*

[58] IAS 31, paragraph 3
[59] Controller's Manual (C180 Joint Ventures), paragraph 1.1

JCAs are incorporated into the Group's financial statements under the appropriate headings"[60].

4.2.13 Further:

"*All JCOs and JCAs must be proportionally consolidated. Rio Tinto has chosen to equity account for its JCEs (which is the only option available under the Australian version of IFRS)*"[61].

4.2.14 Therefore, pursuant to the Controller's Manual, all jointly controlled entities ("**JCEs**") are equity accounted.

4.2.15 Rio Tinto's 2011 and 2012 Annual Financial Statements state that:

"*In accordance with IAS 28 and IAS 31, the Group includes its net investment in equity accounted units in its consolidated statement of financial position*"[62].

4.2.16 Under the equity method of accounting, on initial recognition the investment is recognised at cost, and the carrying amount is then increased or decreased to recognise the investor's share of the profit or loss of the investee after the date of acquisition[63].

Deferred tax liabilities and goodwill

4.2.17 IAS 12 defines deferred tax liabilities as:

"*the amounts of income taxes payable in future periods in respect of taxable temporary differences* […] *which are temporary differences that will result in taxable amounts in determining taxable profit (tax loss) of future periods when the carrying amount of the asset or liability is recovered or settled*"[64].

[60] Controller's Manual (C180 Joint Ventures), paragraph 1.2
[61] Controller's Manual (C180 Joint Ventures), paragraph 4.1
[62] For example, Rio Tinto's 2011 Annual Financial Statements, note 16(a), page 165
[63] IAS 28, paragraph 11
[64] IAS 12, paragraph 5 (**Exhibit E**)

4.2.18 IFRS 3 confirms that, in the context of a business combination:

"*The acquirer shall recognise and measure a deferred tax asset or liability arising from the assets acquired and liabilities assumed in a business combination in accordance with IAS 12*"[65].

4.2.19 Therefore, deferred tax arises in a business combination where the assessed fair value at acquisition (determined during the PPA process) is different to the tax value of the assets acquired. Where a mining entity has been acquired and there has been a fair value uplift to the value of the mineral properties, a deferred tax liability will arise.

4.2.20 Given the recognition of the deferred tax liability, IAS 12 requires goodwill to be recognised:

"*Consequently, those deferred tax assets and deferred tax liabilities affect the amount of goodwill or the bargain purchase gain the entity recognises*"[66].

4.2.21 In this regard, the Controller's Manual states that:

"*The deferred tax assets and liabilities provided will influence the amount of any goodwill, but deferred tax assets and liabilities are not recognised where they arise in relation to the initial recognition of goodwill itself*"[67].

4.3 Rio Tinto's reporting of the Transaction

4.3.1 Rio Tinto's 2011 Annual Financial Statements set out that:

"*After the opening of Rio Tinto's bid for Riversdale Mining Limited ("Riversdale") on 11 January 2011, Rio Tinto cumulatively increased its interests in the issued share capital of Riversdale, culminating in the acquisition of a controlling 52.6 per cent interest on 8 April 2011 (the acquisition date). The cumulative consideration paid to reach the controlling percentage was US$2,191 million, all of which was cash. Subsequent to the acquisition date, Rio Tinto continued to increase its interest in Riversdale and on 1 August 2011, its interest increased to 100 per cent; consideration paid for the remaining 47.4 per cent was US$1,977 million. Riversdale was delisted on 7 July 2011 and subsequently renamed Rio Tinto Coal*

[65] IFRS 3, paragraph 24 (**Exhibit D**)
[66] IAS 12, paragraph 66 (**Exhibit E**)
[67] Controller's Manual (C230 Deferred tax), paragraph 6.2

Mozambique (RTCM). Due to the mutual proximity of the dates of individual increases in Rio Tinto's shareholding prior to the acquisition date, the transactions have been accounted for as an acquisition taking place in only two stages, first the acquisition of a controlling interest on 8 April 2011, and secondly the purchase of additional interests after the acquisition date"[68].

4.3.2 Therefore:

(a) Rio Tinto[69] acquired Riversdale for a total consideration of US$4,168 million[70];

(b) the cash acquired in the Transaction was US$478 million, meaning that the net cash outflow from the group was US$3,690 million[71]; and

(c) the Transaction was a stepped acquisition. Control was obtained on 8 April 2011 and subsequently Rio Tinto bought out the remaining non-controlling interests by increasing its interest to 100% by 1 August 2011.

4.3.3 The acquisition date for financial reporting purposes is when control was first obtained, being 8 April 2011. I set out below Rio Tinto's reporting of the Transaction and a summary of the work performed by Deloitte Touche Tohmatsu ("**Deloitte**") in the context of the PPA process.

4.3.4 At the date of the acquisition Riversdale had tangible assets with a fair value of US$749 million, comprising cash of US$478 million and other tangible assets of US$271 million[72].

[68] Rio Tinto's 2011 Annual Financial Statements, note 39, page 190
[69] Rio Tinto acquired Riversdale through RT Jersey Holdings 2010 Limited
[70] US$2,191 million + US$1,977 million
[71] US$4,168 million – US$478 million
[72] Internal memo from Rio Tinto Energy ("**RTE**") to the Controllers (copying in PwC), titled "*RTCM 2012 HY impairment indicator review*", dated 16 July 2012 ("**HY 2012 Impairment Review Paper**"), Appendix 1 [RT_00225317 to RT_00225323]

4.3.5 The excess of the fair value of the consideration over the fair value of the tangible assets acquired was all attributed to the mineral interests. This is summarised in the table below:

Table 4A: Determination of the fair value of mineral interests acquired[73]

		US$ million	US$ million
Initial consideration		2,191	
Balancing payments		1,977	
Total consideration	*A*		***4,168***
Cash acquired[74]		478	
Other tangible assets acquired		271	
Total tangible assets acquired	*B*		***749***
Excess attributed to the value of mineral interests	*C = A – B*		**3,419**

4.3.6 In order to attribute the excess to the value of the mineral interests, Deloitte were instructed by Rio Tinto[75] to:

"*prepare a report expressing* [their] *opinion as to the fair market value of certain assets acquired in connection with RT Jersey's acquisition of Riversdale as at the Acquisition Date (the Report)*"[76].

4.3.7 Further, Deloitte stated:

"*Rio Tinto Service* [sic] *has advised that the assets acquired in connection with the Acquisition requiring valuation are the mineral interests attached to the Benga coal project (Benga), Zambeze coal project (Zambeze) and exploration licence (EL) 945L* [being Tete East] *located in Mozambique (collectively the Mineral Interests)*"[77].

4.3.8 Deloitte's work and conclusions are set out in its report titled "*Acquisition of Riversdale Mining Limited, Valuation of Mineral Interests*" dated 28 July 2011 (the "**Deloitte PPA Report**").

[73] Appendix 1 to the HY 2012 Impairment Review Paper refers to mineral interests of US$3,426 million. This appears to be a typographical error as the total of the individual values is US$3,419 million. [RT_00225317 to RT_00225323]
[74] Rio Tinto's 2011 Annual Financial Statements, note 39, page 190
[75] Specifically, by Rio Tinto Services Pty Limited
[76] Deloitte PPA Report, Introduction [RT_00180990 to RT_00181048]
[77] Deloitte PPA Report, Introduction [RT_00180990 to RT_00181048]

4.3.9 In assessing the fair value of the mineral interests, Deloitte used a discounted cash flow ("**DCF**") methodology which is based on the theory that the value of an asset equates to the present value of its expected future free net cash flows at the date of valuation. In order to calculate the value of a mineral interest using a DCF, the future free cash flows of the mine over the Life of Mine ("**LOM**") are estimated and are then discounted to the valuation date[78].

4.3.10 The Deloitte PPA Report states that in undertaking its DCF valuation:

"*Rio Tinto Services management prepared a cash flow model as part of the Acquisition which estimates the future cash flows to be generated by the Coal Projects (the Model). The Model has formed the basis of the projected cash flows for our discounted cash flow valuation of the Coal Projects.*

The Model includes projections of real, ungeared (i.e. before interest), after-tax cash flows in USD for each Coal Project. The Model was prepared based on:

• forecast production profiles of the individual coal projects over the LOM of each project

• the latest reserve and resource statements, which are certified in accordance with the JORC Code

• the LOM plans for the Coal Projects

• an assumption that the Coal Projects will have sufficient access to rail and port infrastructure so as not to impede production"[79].

4.3.11 Further:

"*The analysis we have undertaken in respect of the Model includes:*

• holding discussions with the management of Rio Tinto Services concerning the preparation of the projections in the Model and their views regarding the assumptions on which the projections are based

[78] It is necessary to apply a discount rate to the projected cash flows on the basis that: (a) owing to the effects on the value of money over time, US$1 in ten years' time is worth less than US$1 now; and (b) there are a number of risks associated with the cash flows of a company which make it less than certain that they will be received

[79] Deloitte PPA Report, Section 5.1, page 19 [RT_00180990 to RT_00181048]

• *limited analytical procedures regarding the mathematical accuracy of the Model (but neither a review of* [sic] *audit of the Model)* […]

We have made adjustments to the cash flow projections in the Model where it was considered appropriate. These adjustments included, but were not limited to, pricing, foreign exchange rates and inflation"[80].

4.3.12 On the basis of its work, Deloitte assessed the value of the mineral interests as at the acquisition date as follows:

Table 4B: Deloitte's assessment of the fair value of mineral interests[81]

	AU$ million
Benga	1,576
Zambeze	1,564
Tete East	174
Fair value of mineral interests	**3,314**

4.3.13 At the prevailing foreign exchange rate, AU$3,314 million equates to circa US$3,419 million (being the amount identified in Table 4A).

4.3.14 On the basis of Deloitte's work, the fair value of the mineral interests and other assets and liabilities acquired and assumed in the Transaction (prior to the recognition of a deferred tax liability and goodwill) were determined as follows:

80 Deloitte PPA Report, Section 5.1, page 19 [RT_00180990 to RT_00181048]
81 Deloitte PPA Report, page 4 [RT_00180990 to RT_00181048]

Table 4C: The fair value at acquisition of the mineral interests and other assets and liabilities acquired (prior to the recognition of a deferred tax liability and goodwill)[82]

	Mineral interests US$ million	Other assets and liabilities US$ million	Total US$ million
Benga	1,629	173	**1,802**
Zambeze	1,612	7	**1,619**
Tete East	178	**-**	**178**
Zululand Anthracite Colliery	-	54	**54**
Other assets and liabilities	-	37	**37**
Net cash outflow	***3,419***	***271***	***3,690***
Cash	-	478	**478**
Total	**3,419**[83]	**749**	**4,168**

4.3.15 Given the uplift in the fair value of the mineral interests, pursuant to IAS 12 and IFRS 3 (see paragraphs 4.2.17 to 4.2.21 above), a deferred tax liability arose at the date of acquisition of US$1,009 million[84]. Goodwill of US$530 million[85] was also recognised by Rio Tinto with the balancing amount (of US$479 million[86]) being ultimately booked within equity.

4.3.16 The provisional fair values (as at 8 April 2011) of the assets and liabilities of Riversdale were therefore reported in Rio Tinto's interim financial statements for the six months ended 30 June 2011 ("**Rio Tinto's 2011 Interim Financial Statements**") as follows:

[82] HY 2012 Impairment Review Paper, Appendix 1 [RT_00225317 to RT_00225323]
[83] As referred to in respect of Table 4A above, there appears to be a typographical error in the total value of the mineral interests in HY 2012 Impairment Review Paper, Appendix 1
[84] Rio Tinto's 2011 Annual Financial Statements, note 39, page 190
[85] Being 52.6% of US$1,009 million
[86] US$1,009 million – US$530 million

Table 4D: The provisional fair values (as at 8 April 2011) reported in Rio Tinto's 2011 Interim Financial Statements[87]

	Provisional fair value US$ million
Intangible assets (Zambeze and Tete East)	1,797
Investments in equity accounted units (Benga)	1,802
Cash	478
Other assets and liabilities	91
	4,168
Less deferred tax liability	(1,009)
	3,159
Less non-controlling interest (47.4% of 3,159)[88]	(1,498)
	1,661
Goodwill (2,191 less 1,661)	530[89]
Rio Tinto's share of net assets at acquisition date	**2,191**

4.3.17 In its 2011 Annual Financial Statements Rio Tinto stated that the above fair values were provisional and would be finalised within one year of the acquisition[90]. In its 2012 Interim Financial Statements Rio Tinto stated that the acquisition date fair values were finalised by 8 April 2012, with no subsequent revisions to the above provisional fair values noted[91].

4.4 Accounting for the RTCM Assets subsequent to the Transaction

4.4.1 In Table 4D above, I set out the acquisition date fair values of the RTCM Assets. Whilst these represented the fair values as at the date of the acquisition that were determined through the PPA process, they did not necessarily reflect the value of the RTCM Assets as at subsequent reporting dates (including Rio Tinto's half-year reporting date for 2012).

[87] Rio Tinto's 2011 Interim Financial Statements, page 41
[88] The non-controlling interest relates to the 47.4% of the Riversdale that was not acquired by Rio Tinto in April 2011
[89] The goodwill of US$530 million arises as a result of the deferred tax liability of US$1,009 million
[90] Rio Tinto's 2011 Annual Financial Statements, note 12, page 162
[91] Rio Tinto's 2012 Interim Financial Statements, page 38

4.4.2 Specifically, the acquisition date fair values set out in Table 4D:

(a) reflected (in total) Rio Tinto's ownership of 52.6% of Riversdale as a result of the initial acquisition in April 2011, however, they did not reflect Rio Tinto's subsequent acquisition of the remaining 47.4% of Riversdale by 1 August 2011[92]; and

(b) would not reflect any changes to the value of the RTCM Assets between the date of the Transaction and the subsequent year-end and half-year reporting dates.

4.4.3 I consider the carrying amounts as at the relevant year-end and half-year reporting dates below.

Rio Tinto's 2011 Annual Financial Statements

4.4.4 In its 2011 Annual Financial Statements, Rio Tinto was not required to (and did not) disclose the carrying amount of the RTCM CGU at the year-end reporting date. Rio Tinto did however disclose the value of the RTCM goodwill as at the year-end reporting date, with it being carried at the same amount as the acquisition date fair value (as presented in Table 4D above)[93].

Rio Tinto's 2012 Interim Financial Statements

4.4.5 Rio Tinto's 2012 Interim Financial Statements state that the acquisition date fair values of the RTCM Assets were finalised by 8 April 2012, twelve months after the date of the acquisition of the controlling interest in Riversdale[94].

4.4.6 In its 2012 Interim Financial Statements, Rio Tinto was not required to (and did not) disclose the carrying amount of the RTCM CGU at the half-year reporting date. However, I have identified a document[95] from which I have been able to derive the half-year carrying amount of the RTCM CGU. In the table below I summarise the carrying amounts of the RTCM CGU based on the acquisition date fair values (set out at Table 4D above) and as at the half-year reporting date of 30 June 2012:

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[92] The additional interests acquired by 1 August 2011 were accounted for as transactions with non-controlling interests
[93] Rio Tinto's 2011 Annual Financial Statements, note 12, page 160
[94] Rio Tinto's 2012 Interim Financial Statements, page 38
[95] Titled "*Summary_ Coverage of work*" [SEC_UKFCA_E_0001352]

Table 4E: The carrying amount of the RTCM CGU

	Carrying amount based on acquisition date fair values US$ million	Apparent carrying amount at 30 June 2012 US$ million
Investments in equity accounted units (Benga)	1,802	2,071
Intangible assets (Zambeze and Tete East)	1,797	1,832
Cash	478	63
Other assets and liabilities	91	71
	4,168	***4,037***
Less deferred tax liability	(1,009)	(1,028)
	3,159	***3,009***
Goodwill	530	541
Net assets	**3,689**	**3,550**
Carrying amount of the RTCM CGU[96]	**3,211**	**3,487**

4.4.7 The carrying amount of the RTCM CGU as at 30 June 2012 appears reasonable when compared with the carrying amount as at 31 December 2012 but prior to any impairment (see below).

4.4.8 Whilst the above carrying amount of the RTCM CGU at the half-year reporting date is not separately disclosed in Rio Tinto's 2012 Interim Financial Statements, it will be included in the total assets set out in Rio Tinto's statement of financial position as at 30 June 2012[97]. Specifically, the carrying amounts of the individual RTCM Assets will be included in the relevant balances within the statement of financial position, for example goodwill, intangible assets and investments in equity accounted units. Further, if an impairment had been recognised in relation to the RTCM CGU as at 30 June 2012, this would have been reflected in the income statement and the reconciliation of net earnings included in Rio Tinto's 2012 Interim Financial Statements[98]. Additionally, if the impairment was significant to an

[96] Net assets excluding cash
[97] Rio Tinto's 2012 Interim Financial Statements, Group statement of financial position, page 31
[98] Rio Tinto's 2012 Interim Financial Statements, Group income statement and Reconciliation of net earnings to underlying earnings, pages 12 and 27

understanding of the changes in financial position and performance since 31 December 2011, this would also have been separately disclosed in accordance with IAS 34[99].

Rio Tinto's 2012 Annual Financial Statements

4.4.9 In its 2012 Annual Financial Statements, Rio Tinto was not required to (and did not) disclose the carrying amount of the RTCM CGU at the year-end reporting date. However, a PwC audit working paper titled "*RTCM Impairment Allocation*" provides a summary of the carrying amount of the RTCM CGU as at 31 December 2012 both pre and post impairment. This is set out in the table below:

Table 4F: The carrying amount of the RTCM CGU at 31 December 2012 pre and post impairment[100]

	Carrying amount 31 December 2012 (pre impairment) US$ million	**Impairment US$ million**	**Carrying amount 31 December 2012 (post impairment) US$ million**
Benga	2,094	(1,685)	409
Zambeze and Tete East	1,832	(1,581)	251
Other assets and liabilities	7	-	7
	3,933	***(3,266)***	***667***
Goodwill	541	(541)	-
Deferred tax liability	(1,003)	947	(56)
Carrying amount of the RTCM CGU[101]	**3,471**	**(2,860)**	**611**

4.4.10 Therefore, the carrying amount of the RTCM CGU (excluding cash) was reduced by 82% as a result of the impairment.

[99] IAS 34, paragraphs 15 and 15B (b) (**Exhibit A**)
[100] Untitled PwC working paper [PwCUK000003628_0001]; Rio Tinto's 2012 Annual Financial Statements, note 6, page 165
[101] Excludes cash

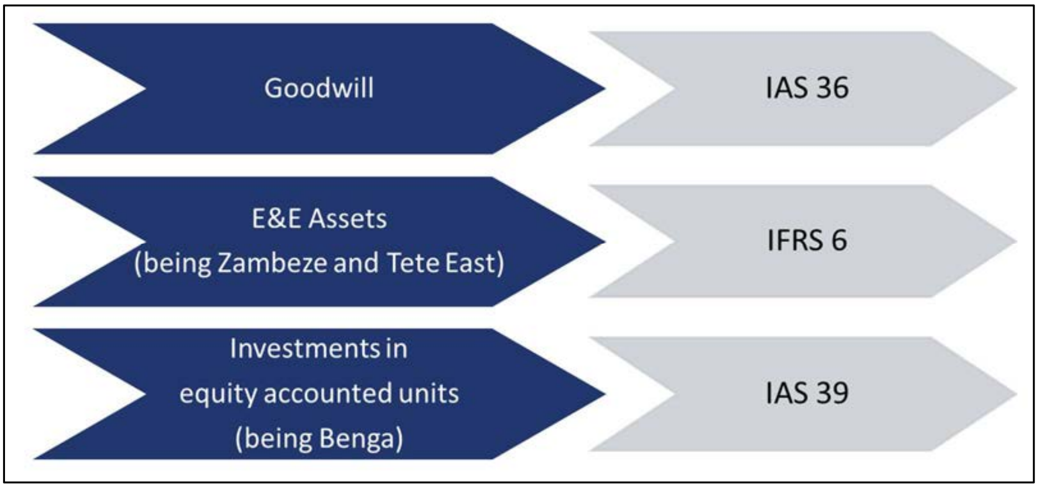
5 When does IFRS require an impairment test to be undertaken?

5.1 Introduction

5.1.1 In this Section I consider when IFRS requires assets to be tested for impairment. An impairment test is a quantitative test which compares the "*recoverable amount*" of an asset or CGU with the "*carrying amount*" at which the asset or CGU is recognised in the financial statements of the entity[102].

5.1.2 The relevant requirements of IFRS in respect of testing for impairment are dependent upon the particular asset in question. The relevant Standards for considering whether an impairment test should be undertaken in relation to the RTCM Assets are as follows:

Figure 5A: The relevant Standards for considering whether an impairment test should be undertaken



5.1.3 In this Section:

(a) I consider the relevant requirements of IFRS in respect of testing for impairment for each of the above three categories of asset (**Sections 5.2 to 5.4**); and

(b) I provide some examples of impairments recognised by entities operating in the mining industry, in order to demonstrate how the requirements identified in (a) above are applied in practice (**Section 5.5**).

[102] IAS 36, paragraph 9 (**Exhibit C**)

5.1.4 The below requirements of IFRS in respect of testing for impairment applied to Rio Tinto's 2012 Interim Financial Statements. These requirements were applicable throughout the Material Reporting Period, irrespective of whether Rio Tinto had finalised the PPA process in relation to RTCM, which it did in April 2012.

5.2 Goodwill

5.2.1 The relevant Standard for considering whether an impairment test should be undertaken in relation to goodwill is IAS 36.

Mandatory impairment test

5.2.2 An entity is required by IAS 36 to undertake a mandatory impairment test in relation to goodwill on an annual basis, irrespective of whether there are indicators of impairment[103]. This is consistent with the Controller's Manual and the accounting policy set out in Rio Tinto's 2011 Annual Financial Statements[104]. In his deposition, Delwin Witthoft, Group Deputy Controller, RTHQ ("**Mr Witthoft**") stated that Rio Tinto undertook annual testing in relation to goodwill as at 30 September each year[105].

5.2.3 Further, in the event that some or all of the goodwill allocated to a CGU was acquired as a result of a business combination during the current annual period, the mandatory impairment test must be undertaken before the year end reporting date[106]. This requirement is not mentioned in the accounting policy set out in Rio Tinto's 2011 Annual Financial Statements or the Controller's Manual[107].

5.2.4 If an entity performs the mandatory impairment test prior to the reporting date, it must separately consider at the reporting date if there is an indicator that the goodwill may be impaired.

[103] IAS 36, paragraph 10 (**Exhibit C**)
[104] Controller's Manual (C360 Impairment of non-current assets), paragraph 1.9; Rio Tinto's 2011 Annual Financial Statements, note 1(e), page 141
[105] Mr Witthoft deposition transcript, dated 6 March 2019, page 17
[106] IAS 36, paragraph 96 (**Exhibit C**)
[107] I have identified an internal Rio Tinto email dated 17 April 2012 which did refer to this requirement as follows: "*if some or all of the goodwill allocated to a cash-generating unit was acquired in a business combination during the current annual period, that unit shall be tested for impairment before the end of the current annual period*" (Defendants Exhibit 104)

Indicators of impairment test

5.2.5 IAS 36 requires an entity to "*assess at the end of each reporting period whether there is any indication that an asset may be impaired*"[108].

5.2.6 This requirement was applicable throughout the Material Reporting Period, irrespective of when Rio Tinto finalised the PPA process in relation to RTCM.

5.2.7 In this regard, IAS 36 requires the entity to consider, "*as a minimum*"[109], both internal and external sources of information and it provides a list, which is "*not exhaustive*"[110], of indicators of impairment that the entity is required to consider. Given the importance of such indicators of impairment to the matters I have been instructed to consider, I have reproduced the list below:

"*External sources of information*

(a) during the period, an asset's market value has declined significantly more than would be expected as a result of the passage of time or normal use.

(b) significant changes with an adverse effect on the entity have taken place during the period, or will take place in the near future, in the technological, market, economic or legal environment in which the entity operates or in the market to which an asset is dedicated.

(c) market interest rates or other market rates of return on investments have increased during the period, and those increases are likely to affect the discount rate used in calculating an asset's value in use and decrease the asset's recoverable amount materially.

(d) the carrying amount of the net assets of the entity is more than its market capitalisation.

Internal sources of information

(e) evidence is available of obsolescence or physical damage of an asset.

(f) significant changes with an adverse effect on the entity have taken place during the period, or are expected to take place in the near future, in the extent to which, or manner in which,

[108] IAS 36, paragraph 9 (**Exhibit C**)
[109] IAS 36, paragraph 12 (**Exhibit C**)
[110] IAS 36, paragraph 13 (**Exhibit C**)

an asset is used or is expected to be used. These changes include the asset becoming idle, plans to discontinue or restructure the operation to which an asset belongs, plans to dispose of an asset before the previously expected date, and reassessing the useful life of an asset as finite rather than indefinite.

(g) evidence is available from internal reporting that indicates that the economic performance of an asset is, or will be, worse than expected"[111].

5.2.8 The list is not exhaustive and an entity is still required to undertake an impairment test if it has identified other indicators that an asset may be impaired[112]. Again, this approach is consistent with the Controller's Manual[113].

5.2.9 In its Wells Submission, Rio Tinto draws a distinction between the RTCM goodwill and "*goodwill in the typical sense (i.e., incremental value attributed to assembled work force)*"[114]. This is because, as described in Section 4.2, the RTCM goodwill arose following the recognition of a deferred tax liability which had arisen as a result of the increase in the fair value of the mineral properties. However, IAS 36 does not draw any distinction between different types of goodwill and the reasons underpinning its recognition and therefore, in my view, Rio Tinto's explanation is not consistent with the requirements of IFRS.

5.2.10 My view is confirmed by a guide to deferred tax published by Grant Thornton which states that goodwill created as a result of the recognition of deferred tax liabilities on intangible assets acquired in a business combination is subject to the requirements of IAS 36 in relation to impairment[115]. Further, I set out at **Appendix D** to this report an example of an entity testing goodwill for impairment which arose following the recognition of a deferred tax liability.

5.2.11 In a letter to the IASB dated 30 May 2014, Rio Tinto referred to the requirement to recognise goodwill arising as a result of deferred tax on initial recognition of net assets in a business combination and stated that it felt the requirement "*is particularly inappropriate*"[116]. In this

[111] IAS 36, paragraph 12 (**Exhibit C**)
[112] IAS 36, paragraph 13 (**Exhibit C**)
[113] Controller's Manual (C360 Impairment of non-current assets), paragraphs 3.1 to 3.3
[114] Rio Tinto's Wells Submission, page 19
[115] Grant Thornton publication titled "*Deferred tax – a Chief Financial Officer's guide to avoiding the pitfalls*", dated February 2013, Section 5.3 (**Exhibit F**)
[116] Letter from Rio Tinto to the IASB, dated 30 May 2014, page 5 (**Exhibit G**)

regard, Rio Tinto stated that the goodwill would "*inevitably be impaired at some point whilst the deferred tax will simply unwind over the life of the mine*". The treatment of deferred tax and the related goodwill as separate assets and liabilities is consistent with my understanding and experience, as after acquisition these assets and liabilities will need to be considered and measured independently for accounting purposes. The goodwill would therefore still be subject to impairment testing, irrespective of it being created as a result of the recognition of a deferred tax liability.

The level at which the impairment test is undertaken

5.2.12 An impairment test under IAS 36 is carried out at the level of the individual asset in question. In circumstances where it is not possible to estimate the recoverable amount of an individual asset[117] (as is the case with goodwill), IAS 36 provides that the entity shall determine the recoverable amount of the CGU to which the asset belongs[118].

5.2.13 This is also reflected in the Controller's Manual:

"*Recoverability assessments are performed at the individual asset level, unless the asset does not generate cash inflows that are largely independent of those from other assets or group of assets. If this is the case, recoverable amount is determined for the CGU to which the asset belongs.* ***<u>It is generally the case in Rio Tinto's businesses that impairment reviews relate to a CGU</u>***" [emphasis added][119].

[117] The circumstances where it is not possible to determine the recoverable amount of an individual asset are confirmed at paragraph 67 of IAS 36 (**Exhibit C**). One of these circumstances is where the individual asset does not generate cash inflows that are largely independent of those from other assets

[118] IAS 36, paragraph 66 (**Exhibit C**)

[119] Controller's Manual (C360 Impairment of non-current assets), paragraph 7.1

5.3 E&E Assets

5.3.1 "**E&E Assets**" (being assets in the exploration or evaluation stage of the mining life cycle) are accounted for in accordance with IFRS 6.

5.3.2 Under IFRS 6, E&E Assets must be tested for impairment only when there is an indicator of impairment[120]. Therefore, unlike goodwill, E&E Assets are not subject to a mandatory annual impairment test under IFRS and, instead, are required to be tested only when there is an indicator of impairment.

5.3.3 Rio Tinto's 2011 Annual Financial Statements state that expenditure on exploration activity is not capitalised and capitalisation of expenditure on evaluation commences "*when there is a high degree of confidence in a project's viability and therefore it is probable that future economic benefits will flow to the Group*". Rio Tinto's stated accounting policy in relation to capitalised evaluation expenditure is as follows:

"*The carrying values of capitalised evaluation expenditure are reviewed twice a year by management. In the case of undeveloped mining projects, there may be only inferred resources to form a basis for that impairment review. The review is based on a status report summarising the Group's intentions for development*"[121].

5.3.4 Rio Tinto's Controller's Manual also reflects the requirement for Rio Tinto to review the carrying amounts of E&E Assets twice per year and, specifically, at each half-year and year-end reporting date[122].

5.3.5 Rio Tinto's stated accounting policy does not refer to the specific requirements of IFRS 6 in relation to testing E&E Assets for impairment when certain facts and circumstances exist, which are explained below.

[120] IFRS 6, paragraph 18 (**Exhibit H**)
[121] Rio Tinto's 2011 Annual Financial Statements, note 1(f), page 141. This is consistent with the accounting policy set out in Rio Tinto's 2012 Annual Financial Statements (note 1(f), page 150)
[122] Controller's Manual (C120 Exploration and Evaluation Costs), paragraph 3.9

Indicators of impairment test

5.3.6 IFRS 6 confirms that the list of impairment indicators set out in IAS 36 (see paragraph 5.2.7 above) does not apply to E&E Assets[123]. Instead, IFRS 6 provides a separate list of indicators of impairment:

"*One or more of the following facts and circumstances indicate that an entity should test exploration and evaluation assets for impairment* ***(the list is not exhaustive)****:*

(a) the period for which the entity has the right to explore in the specific area has expired during the period or will expire in the near future, and is not expected to be renewed.

(b) substantive expenditure on further exploration for and evaluation of mineral resources in the specific area is neither budgeted nor planned.

(c) exploration for and evaluation of mineral resources in the specific area have not led to the discovery of commercially viable quantities of mineral resources and the entity has decided to discontinue such activities in the specific area.

(d) sufficient data exist to indicate that, although a development in the specific area is likely to proceed, the carrying amount of the exploration and evaluation asset is unlikely to be recovered in full from successful development or by sale" [emphasis added][124].

5.3.7 The impairment indicator requirements contained in IFRS 6 differ from and are stricter than the indicators in IAS 36, for example, they refer to the requirement for "*sufficient data*" to exist. Whether "*sufficient data*" exists to indicate that the carrying amount of an E&E Asset (or pooled E&E Assets) is unlikely to be recovered in full is a matter of judgement.

5.3.8 If an impairment indicator under IFRS 6 is identified, IFRS 6 confirms that an impairment test should be carried out, in accordance with IAS 36[125].

5.3.9 The Controller's Manual provides a list of indicators of impairment specific to Rio Tinto, including indicators of impairment that would be relevant to E&E Assets, for example[126]:

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[123] IFRS 6, paragraph 19 (**Exhibit H**)
[124] IFRS 6, paragraph 20 (**Exhibit H**)
[125] IFRS 6, paragraph 20 (**Exhibit H**)
[126] Controller's Manual (C360 Impairment of non-current assets), paragraphs 3.2 and 3.3

"*Indications that the economic performance of an asset is, or will be, significantly worse than expected*";

"*A material change from the prior year in the estimates of proven and probable ore reserves and resources (as reported in accordance with the 'JORC Code') included within the current mine plan, other than a reduction through depletion*"; and

"*Any other change that is likely to have a material impact on the value of the CGU including, but not limited to, a significant pit wall failure or a significant reorganization*".

5.3.10 Further, industry publications issued by a variety of accountancy firms[127] provide various examples of indicators of impairment in the mining industry, including the following[128]:

(a) "*a significant deterioration in expected future commodity prices*";

(b) "*a large cost overrun on a capital project such as an overrun during the development and construction of a new mine*";

(c) "*a significant revision of the life of mine plan*";

(d) "*higher cut-off grades leading to lower reserves*";

(e) "*adverse changes in government regulations and environment law, including a significant increase in the tax or royalty burden payable by the mine*";

(f) "*Insufficient exploration expenditure incurred during the period, infringing the terms of the exploration licence and therefore threatening the loss of the licence*";

(g) "*Insufficient resources to complete the exploration programme or development phase, so that the commercial production phase cannot be reached*";

(h) "*Higher than expected costs of finance to develop a resource, meaning that the resource cannot be exploited commercially*";

[127] Including PwC, KPMG and PKF

[128] PwC "*Financial reporting in the mining industry - International Financial Reporting Standards*" (6th Edition), page 98 (**Exhibit I**); KPMG "*Mining Financial Reporting Survey 2012*", page 26 (**Exhibit J**); PKF Mining Survey, October 2009, page 3 (**Exhibit K**)

(i) "*Increase in development or production costs*"; and

(j) "*Lower than expected grades arising from exploration data*".

The level at which the impairment test is undertaken

5.3.11 Depending on the accounting policy adopted, entities may be able to "pool" E&E Assets and test the aggregate carrying amount of the E&E Assets collectively[129]. This may enable an entity to avoid recognising an impairment on a specific underperforming E&E Asset if the aggregate of the pooled E&E Assets is recoverable.

5.3.12 For entities which test for impairment at the CGU level (and do not pool E&E Assets across more than one CGU), there is no difference between the level at which the E&E Assets are tested and the level at which other non-current assets (for example, goodwill) are tested for impairment as required by IAS 36.

5.3.13 Rio Tinto's 2011 Annual Financial Statements state that its accounting policy in relation to non-current assets (including E&E Assets) is to test assets for impairment at the CGU level, as follows:

"*Impairment is assessed at the level of cash-generating units which, in accordance with IAS 36 "Impairment of Assets", are identified as the smallest identifiable group of assets that generates cash inflows, which are largely independent of the cash inflows from other assets.*

In some cases, the business units within product groups consist of several operations with independent cash generating streams, which constitute separate cash-generating units"[130].

5.3.14 When Rio Tinto undertook the impairment test underpinning the impairment to RTCM that was recognised in its 2012 Annual Financial Statements (the "**January 2013 Impairment Test**"), the E&E Assets (Zambeze and Tete East) were included in the impairment test for the RTCM CGU, which appears to be consistent with the above accounting policy.

[129] IFRS 6, paragraph 22 (**Exhibit H**)
[130] 2011 Annual Financial Statements, note 1(i), page 143. This is consistent with the accounting policy set out in Rio Tinto's 2012 Annual Financial Statements (note 1(i), pages 151 and 152)

5.4 Investments in equity accounted units

5.4.1 As referred to at paragraph 4.2.15, Rio Tinto's 2011 and 2012 Annual Financial Statements state that:

"*In accordance with IAS 28 and IAS 31, the Group includes its net investment in equity accounted units in its consolidated statement of financial position*"[131].

5.4.2 The relevant accounting standard for a JV accounted for using the equity method is IAS 31. Whilst IAS 31 does not refer to impairment, the equity method of accounting set out in paragraphs 31 to 34 of IAS 28 does. In the then extant version of IFRS, the relationship between IAS 31 and IAS 28 was not referred to, although both IAS 28 and IAS 31 were referred to in Rio Tinto's 2011 and 2012 Annual Financial Statements (see paragraph 5.4.1 above) and it was generally accepted that such a relationship existed. For example, the 2012 Manual of Accounting issued by PwC stated in relation to JVs:

"*For equity accounted investments, the approach to impairment testing is considered in paragraphs 31 to 34 of IAS 28*"[132].

5.4.3 Further, other guidance reflects the relevance of IAS 28:

"*IAS 28 Investments in associates and joint ventures indicates that entities should apply IAS 39 Financial Instruments: Recognition and Measurement to determine whether there are indicators of any impairment losses with respect to an investment in an associate or joint venture. Generally, this requires companies to assess whether there is any objective evidence that an equity accounted investment is impaired at the end of each reporting period. If there are indicators of impairment, IAS 36 is then applied*"[133].

5.4.4 Therefore, a JV accounted for using the equity method should be considered for impairment by applying the requirements of IAS 39. Once the requirement to undertake an impairment test has been identified, the impairment test itself is carried out in accordance with IAS 36. I summarise below the relevant requirements of IAS 39 and IAS 36.

[131] For example, Rio Tinto's 2011 Annual Financial Statements, note 16(a), page 165
[132] PwC Manual of Accounting IFRS 2012, Section 28.123, pages 28026 and 28027 (**Exhibit L**)
[133] KPMG "*Mining Financial Reporting Survey 2014*", page 17 (**Exhibit M**)

Evidence of impairment test

5.4.5 Similar to E&E Assets and unlike goodwill, investments in equity accounted units are not subject to a mandatory annual impairment test under IFRS and, instead, are required to be tested only when there is objective evidence (i.e. an indicator) of impairment[134]. This is consistent with the accounting policy set out in Rio Tinto's 2011 and 2012 Annual Financial Statements[135].

5.4.6 IAS 39 provides that an impairment should be recognised if a "loss event" has occurred, and that the loss event impacts estimated future cash flows[136].

5.4.7 IAS 39 provides a list of loss events that would constitute objective evidence of impairment, including the following:

"*observable data indicating that there is a measureable decrease in the estimated future cash flows from a group of financial assets since the initial recognition of those assets, although the decrease cannot yet be identified with the individual financial assets in the group*"[137].

5.4.8 Therefore, it is clear from both IAS 28 and IAS 39 that an impairment test was required to be undertaken in relation to JVs accounted for as an investment in an equity accounted unit if there was objective evidence of a loss event by the reporting date.

The level at which the impairment test is undertaken

5.4.9 Impairment tests for investments in equity accounted units are undertaken in accordance with IAS 36. As referred to in Section 5.2, IAS 36 requires an impairment test to be carried out for the individual asset in respect of which the test is required unless it is not possible to estimate the recoverable amount of the individual asset, in which case the entity shall determine the recoverable amount of the CGU to which the asset belongs.

[134] IAS 39, paragraph 58 (**Exhibit N**)
[135] Rio Tinto's 2011 Annual Financial Statements, note 1(e), page 141; Rio Tinto's 2012 Annual Financial Statements, note 1(e), page 150
[136] IAS 39, paragraph 59 (**Exhibit N**)
[137] IAS 39, paragraph 59(f) (**Exhibit N**)

5.4.10 Judgement is sometimes required in order to conclude on whether the cash flows of an asset are independent from those of others and, therefore, whether the asset can be tested for impairment individually.

5.4.11 The accounting policy in relation to investments in equity accounted units set out in Rio Tinto's 2011 Annual Financial Statements is as follows:

"*Investments in equity accounted units (EAUs) including any goodwill are tested for impairment **as a single asset** when a trigger for impairment has been identified*" [emphasis added][138].

5.4.12 Rio Tinto's stated accounting policy is therefore that impairment tests for investments in equity accounted units are undertaken at the individual asset level, as opposed to the CGU level[139]. However, even though it is contrary to Rio Tinto's stated accounting policy, IAS 36 would permit the impairment test to be undertaken for the RTCM CGU as a whole to the extent the cash flows of an investment in an equity accounted unit are not independent from those of other assets.

5.5 Impairments recognised by entities operating in the mining industry

5.5.1 In order to demonstrate how the relevant requirements of IFRS in respect of testing for impairment are applied in practice, I set out at **Appendix E** to this report some examples of impairments to mining assets, investments in equity accounted units and goodwill recognised by entities operating in the mining industry. The reasons for these impairments include the following:

(a) the receipt of new drilling data;

(b) a downward revision to estimated coal volumes;

(c) a delay to exploration drilling activity;

[138] Rio Tinto's 2011 Annual Financial Statements, note 1(e), page 141. This is consistent with the accounting policy set out in Rio Tinto's 2012 Annual Financial Statements (note 1(e), page 150)

[139] If this interpretation of the accounting policy is correct, Rio Tinto does not appear to have applied its stated accounting policy with respect to the RTCM investment in an equity accounted unit (Benga) when undertaking the January 2013 Impairment Test. Whilst, as I conclude later in this report, an impairment test was required for Benga, Rio Tinto's impairment test does not appear to have been undertaken at the individual asset level and was instead undertaken for the RTCM CGU as a whole

(d) changes to project schedules or the deferral of growth projects;

(e) challenges with the development of infrastructure;

(f) higher mining, operating and / or capital costs;

(g) weak economic and market circumstances; and

(h) an overall inability to realise the potential of an asset in the short-term, despite its future potential.

6 Significant events relating to reserves and resources at RTCM

6.1 Introduction

6.1.1 The JORC Code defines resources as having "*reasonable prospects for eventual economic extraction*" and reserves as being the economically mineable part of a resource where "*extraction could reasonably be justified*"[140]. The JORC Code requires that companies review and publish their reserves and resources at least annually and the SEC requires companies to provide information about reserves on the annual Form 20-F.

6.1.2 In this Section I set out an overview of the relevant significant events relating to the reserves and resources at RTCM shortly before and during the Material Reporting Period including:

(a) the reserves and resources reported by Riversdale prior to the Transaction (**Section 6.2**);

(b) the reserves and resources reported in the Deloitte PPA Report (**Section 6.3**);

(c) Rio Tinto's subsequent write down of RTCM's reserves and resources (**Section 6.4**) and the related work undertaken by Deloitte (**Section 6.5**); and

(d) the reserves and resources of the Tete East and Minjova tenements (**Section 6.6**).

6.1.3 I also provide a timeline of significant events at **Appendix F**.

6.1.4 Where I have cited contemporaneous information and transcripts of witness depositions, I have included these because I consider them to be relevant to the assumptions upon which I have based my consideration of whether there were indicators of impairment in relation to RTCM by 30 June 2012. I have assumed, only for the purposes of this report, that the statements within the cited information are true.

[140] JORC Code, clauses 19 and 28, pages 7 and 10

6.2 Reserves and resources reported by Riversdale

6.2.1 In the following table, I summarise the reserves and resources reported in Riversdale's financial statements for the financial year ended 31 December 2010 ("**Riversdale's 2010 Annual Financial Statements**") in respect of its principal mineral properties:

Table 6A: The reserves and resources reported in Riversdale's 2010 Annual Financial Statements[141]

Mineral property	Resources Mt	Reserves Mt
Benga	4,032	502
Zambeze	9,045[142]	-
Tete East	-	-

6.2.2 Prior to the Transaction, Rio Tinto's business case for RTCM (based on the "**Acquisition Model**"[143]) was based on the construction of two open cut mines at Benga and Zambeze together with a further "*small underground operation*"[144], being Tete East[145]. For the purposes of this report, I have assumed that Rio Tinto identified prior to the Transaction that the reserves and resources reported in Riversdale's 2010 Annual Financial Statements would

[141] Riversdale's 2010 Annual Financial Statements, page 17

[142] Of the 9,045Mt of resources reported for Zambeze, 2,514Mt was reported to be located at depths between 500m and 750m below the surface and 400Mt was at depths located over 750m below the surface

[143] "Riversdale Valuation 2010 11 23 - Nov PEG update", dated 23 November 2010 [RT_00337763]. I understand that this is the model that was used by Rio Tinto when it initially assessed the value of Riversdale prior to the Transaction

[144] Rio Tinto Coal Mozambique, "*Developing a tier 1, long life, low cost coking coal business*", Conceptual Growth Programme, dated September 2012 ("**Conceptual Growth Programme**"), paragraph 4.4.1, page 13 [RT_00325682 to RT_00325791]

[145] "Riversdale Valuation 2010 11 23 - Nov PEG update", dated 23 November 2010 includes licence 945L which the Conceptual Growth Programme states relates to Tete East (page 33) [RT_00337763] [RT_00325682 to RT_00325791]

likely require writing down. I have identified a number of contemporaneous Rio Tinto documents which are consistent with this assumption[146, 147, 148, 149, 150, 151].

6.3 Reserves and resources reported in the Deloitte PPA Report

6.3.1 As set out in Section 4.3, in the context of the PPA process Rio Tinto instructed Deloitte to:

"*prepare a report expressing* [their] *opinion as to the fair market value of certain assets acquired in connection with RT Jersey's acquisition of Riversdale as at the Acquisition Date (the Report)*"[152].

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[146] A report produced by Rio Tinto's Exploration department ("**RTX**") titled "*Project Ralph Geology and Coal Resources Due Diligence*" dated 16 November 2010 (the "**RTX Due Diligence Report**") stated: "*Publicly announced resource estimates for the Zambeze significantly overstate coal resources due to a lack of meaningful geological and mining cut-off criteria that is considered inconsistent with the requirements of the JORC Code*" and "*Application of meaningful cut-off criteria and re-assessment of both structural and coal quality continuity will also contribute to a significant downgrading of currently published resources*" (RTX Due Diligence Report, pages 3 and 4 [RT_00191385 to RT_00191456])

[147] A report produced by Rio Tinto's Technology and Innovation ("**T&I**") department titled "*Project Ralph Technical Due Diligence*" dated 7 January 2011 (the "**RT T&I Due Diligence Report**") stated: "*Very large tonnages quoted as JORC Coal Resources (4 billion tonnes for Benga and 9 Billion tonnes for Zambeze) are dominated by coal* […] *which Rio Tinto and its external advisors consider has only remote prospects of eventual economic extraction, due largely to great depth and low product yield. It is expected that perhaps one-third to one-half of this quantity will be reclassified as Mineralised Inventory under Rio Tinto's application of the JORC Code, triggering a write-down of published Coal Resources within the first year of control.*
Coal classified by Riversdale as Measured and Indicated Resources at Benga and Zambeze is less likely to be affected by reclassification. However, approximately 15% of the Benga Measured and Indicated Resources are contained in a seam which is neither scheduled to be mined nor will be accessible for mining once the current mine plan is completed" and "*the recently appointed Riversdale General Manager Resource Development, who has qualifications, experience and responsibility in the area of Coal Resource estimation and reporting, expressed his professional opinion that the currently quoted Resources are unable to be substantiated*" (RT T&I Due Diligence Report, Section 1, page iv and Section 11.1, page 135 [RT_SEC_00057889 to RT_SEC_00058070])

[148] RTX stated in August 2010 that the reduction of resources expected for Zambeze was likely to be 30% to 40% (Internal memo, titled "*Project Ralph Zebra Geological and Resource Risks*", dated 5 August 2010, page 2 [RT_SEC_00110771 to RT_SEC_00110774])

[149] An external advisor stated that, in accordance with its criteria, a reduction in the order of 45% was possible (RT T&I Due Diligence Report, Section 11.1, page 135, footnote 28 [RT_SEC_00057889 to RT_SEC_00058070])

[150] By November 2010, an RTX model of the Zambeze resources reflected that there was potential for only 3,300Mt of resources, which is 63.5% lower than the figure of 9,045Mt reported in Riversdale's 2010 Annual Financial Statements. This was greater than the reduction of 30% to 40% estimated by RTX in August 2010 and of 45% estimated by Rio Tinto's external advisor (RTX Due Diligence Report, page 51 [RT_00191385 to RT_00191456])

[151] A Rio Tinto Board Paper dated 7 December 2010 stated that the anticipated downgrade to the reserves and resources of both Benga and Zambeze was not anticipated to have an impact on the valuation of RTCM "*as the subject resources are not in the life of mine plans*" (Rio Tinto Board Paper, The Acquisition of Riversdale Mining Limited, A paper from Doug Ritchie, Chief Executive, RTE ("**Mr Ritchie**"), dated 7 December 2010, page 5 [RT_00190863 to RT_00190942])

[152] Deloitte PPA Report, Introduction [RT_00180990 to RT_00181048]

6.3.2 Certain write-down adjustments to the reserves and resources reported by Riversdale appear to have been taken into account in the Deloitte PPA Report. In the table below I set out a comparison between the reserves and resources reported in Riversdale's 2010 Annual Financial Statements and those incorporated into Deloitte's work in connection with the PPA.

Table 6B: The reserves and resources incorporated into Deloitte's PPA work

	Reported in Riversdale's 2010 Annual Financial Statements[153]	**Incorporated into Deloitte's PPA work[154]**	**Difference**
	Mt	**Mt**	**Mt**
Resources			
Benga	4,032	-	(4,032)
Zambeze	9,045	1,530	(7,515)
Tete East	-	200	200
	13,077	**1,730**	**(11,347)**
Reserves			
Benga	502	502	-
Zambeze	-	-	-
Tete East	-	-	-
	502	**502**	**-**

6.3.3 In its assessment of the fair value of the mineral properties at the date of the Transaction, Deloitte stated that they had assumed:

(a) in relation to Benga, saleable production based upon "*mining 100% of Benga's proved and probable reserves of 502 Mt*"[155], with an additional 10% to 15% premium added to the assessed value to account for the potential for Benga's resources to be converted to reserves and / or additional resource discoveries[156];

(b) in relation to Zambeze, saleable production based upon "*1.53 Bt of resources being upgraded to proven and probable reserves*"[157], being approximately 17% of Zambeze's resources, with an additional 10% to 15% premium added to the assessed value to

[153] Table 6A
[154] Paragraph 6.3.3
[155] Deloitte PPA Report, Section 5.4, page 21 [RT_00180990 to RT_00181048]
[156] Deloitte PPA Report, Section 7.2.3, page 31 [RT_00180990 to RT_00181048]
[157] Deloitte PPA Report, Section 5.4, page 22 [RT_00180990 to RT_00181048]

account for the potential for Zambeze's resources to be converted to reserves and / or additional resource discoveries[158]; and

(c) in relation to Tete East, saleable production based upon "*200.0 Mt of in-situ coal resources being upgraded to proven and probable reserves*"[159]. No premium was included for Tete East as the project was still at a conceptual stage and the model assumed a significant level of undefined resources (200Mt) would be identified, upgraded to reserves and later converted to saleable production[160].

6.3.4 As part of a review of the accounting issues and judgements relating to Rio Tinto's financial information for the six months ended 30 June 2011, PwC appears to have reviewed the Deloitte PPA Report[161].

6.4 Rio Tinto's write down of RTCM's reported reserves and resources

6.4.1 In December 2011 internal Rio Tinto correspondence stated that the reserves and resources of RTCM would likely require reducing by more than estimated by Rio Tinto and its external advisors during the due diligence process[162, 163].

[158] Deloitte PPA Report, Section 7.2.3, page 31 [RT_00180990 to RT_00181048]
[159] Deloitte PPA Report, Section 5.4, page 23 [RT_00180990 to RT_00181048]
[160] Deloitte PPA Report, Section 7.2.3, page 31 [RT_00180990 to RT_00181048]
[161] In respect of the 10-15% premium assumed by Deloitte, PwC stated: "*We have considered the appropriateness of this estimate based on our understanding of Riversdale's assets and comparing to other recent resource industry transactions. We note in particular that Benga has 4 billion tonnes of resources that are not factored into the life of mine plan and that the Zambeze life of mine plan assumes that out of 9 billion tonnes of resources, 1.53 billion tonnes will be converted to reserves. The life of mine plans are used in the discounted cash flow valuations. In addition Riversdale's portfolio of other tenements are largely unexplored. While these factors suggest considerable upside in the valuations, this is offset by the uncertainties in relation to converting resources to reserves and the timing of their monetisation together with the re-assessment of resource quantities in line with Rio Tinto assumptions. We have also observed the application of premiums in other recent resource acquisition valuations. We therefore concur with the premium used by Deloitte*" (Rio Tinto, Audit Committee Meeting, Paper on Accounting Issues, A paper from Controllers and PricewaterhouseCoopers, pages 4 and 5 [RT_00463641 to RT_00463653])
[162] For example, in an email to Eric Finlayson, Managing Director, RTCM ("**Mr Finlayson**") dated 19 December 2011, Andrew Woodley, Chief Operating and Development Officer, RTCM ("**Mr Woodley**") stated: "*I today met with Rod Smith who we engaged (his team and a consultant) to review the reserves and resource statement. Whilst it is not finalised and may move around a little, the current state of play is narrowing the end point range. Unfortunately still a sizeable write down – more than due diligence. Will challenge a sizable and long life Benga mine on current reserves. Another challenge for us to take on and find a pathway through*" (Email from Mr Woodley to Mr Finlayson, dated 19 December 2011, subject: "*Reserves and Resource*" [RT_00238326 to RT_00238327])
[163] In a subsequent email dated 22 December 2011, Mr Woodley referred to the following estimates of the "*sizeable write down*" to the reserves and resources reported in Riversdale's 2010 Annual Financial Statements:

6.4.2 The write down to reserves and resources was later recorded in Rio Tinto's 2011 Annual Financial Statements[164]. The reasons for the decrease, according to a Rio Tinto presentation dated January 2012, are summarised in the table below:

Table 6C: Reasons for the decrease in reserves and resources[165]

	Benga resources Mt	Benga reserves Mt	Zambeze resources Mt	Zambeze reserves Mt
Reported by Riversdale	**4,032**	**502**	**9,045**	**-**
"*Material that is not coal*"	(314)	-	(1,404)	-
"*Material deeper than 500m*"	(1,278)	-	(2,457)	-
"*Material that is not economic*"	(1,826)	(191)	(3,199)	-
Reported by Rio Tinto	**613**	**311**	**1,985**	**-**
Percentage change	(85%)	(38%)	(78%)	-

6.4.3 Subsequent to the issuance of Rio Tinto's 2011 Annual Financial Statements, Rio Tinto identified that the reported downgraded 2011 Benga resources of 613Mt were still overstated as that figure actually represented the total of both the Benga reserves and resources[166]. The 2011 Benga resources were later restated to 302Mt in Rio Tinto's 2012 Annual Financial Statements[167].

6.4.4 The overall decrease in reserves and resources is illustrated graphically below, together with a comparison with the saleable production assumed in the Deloitte PPA Report:

"*- Zambeze resource written down from 9.045bn tonnes resource to ~2bn tonnes (approx. 22% of prior Riversdale stated)*
- Benga resource written down from 4.032bn tonnes to ~1bn tonnes (approx. 25% of prior Riversdale stated)
- Benga reserves appear to be in the range of 230-500mt compared with Riversdale's declared reserve of 502mt. The Benga reserves have some unresolved variables, hence the wider range" (Email from Mr Woodley to Brendon Brodie-Hall, Mining Executive, RTE ("**Mr Brodie-Hall**") (cc: Mr Finlayson), dated 22 December 2011, subject: "*RE: RTCM Reserves and Resource*" [RT_SEC_00274379 to RT_SEC_00274381])

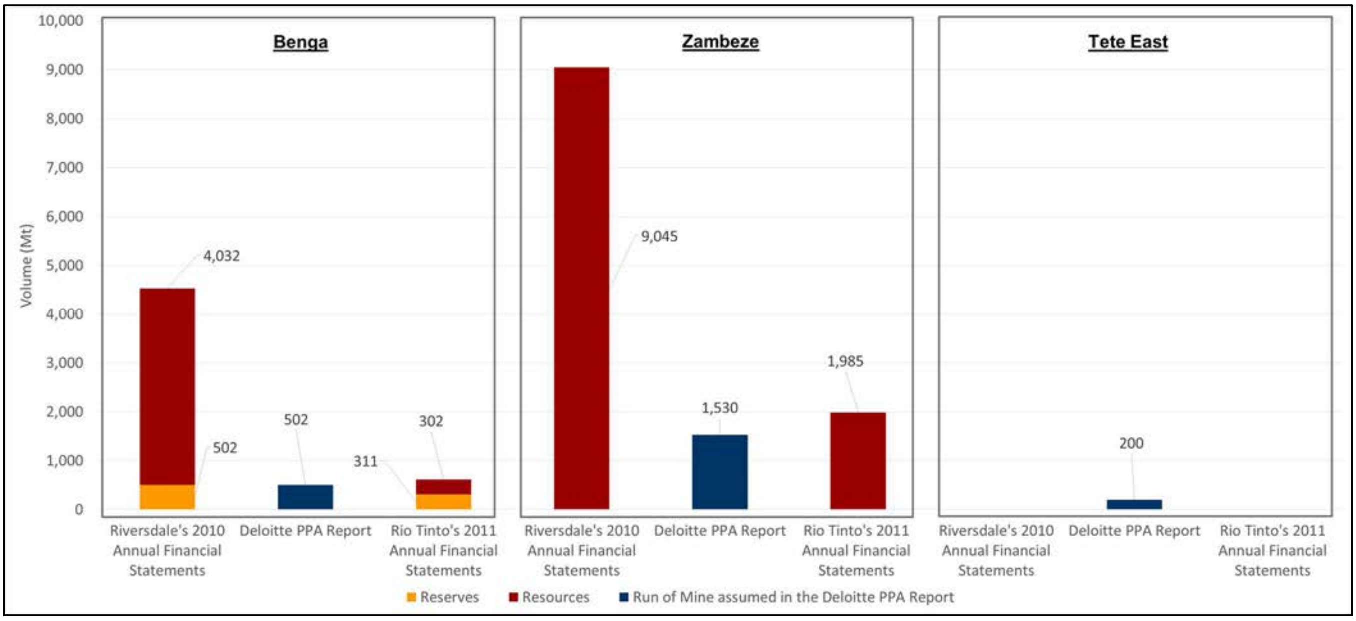
[164] Rio Tinto's 2011 Annual Financial Statements, pages 49 and 52

[165] Rio Tinto Coal Mozambique, Reserve and Resource Summary, dated 20 January 2012 [RT_00188906]

[166] Email from Rob Russell-Smith, Principal Valuations, RTHQ ("**Mr Russell-Smith**") to Lindsey Henniker-Heaton, Associate Consultant, Rio Tinto T&I ("**Ms Henniker-Heaton**") (cc: Mr Witthoft), dated 8 January 2013 [RT_00089038 to RT_00089041]

[167] Rio Tinto's 2012 Annual Financial Statements, pages 55 and 59

Figure 6A: The identified decrease in reserves and resources[168]



6.4.5 It was stated by Rio Tinto that it "*should not come as a surprise to the market that resources and reserves reported by Rio Tinto are different to those previously reported by Riversdale. However, what may come as a surprise is the size of the difference. The market would also be aware of the difference in approach between Rio Tinto, an established major mining company, and Riversdale, a new junior mining company, and the different techniques permitted under the JORC code to estimate reserves and resources. Junior mining companies are known to be less conservative with their reserves and resources estimates*"[169].

6.5 Subsequent work undertaken by Deloitte

6.5.1 In January 2012, based on Rio Tinto's correspondence, Rio Tinto appears to discuss (both internally and with Deloitte) the impact of the downgrading of reserves and resources on the PPA, which had not yet been finalised[170].

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[168] See **Appendix G.** The Benga resources per Rio Tinto's 2011 Annual Financial Statements have been corrected for the error referred to at paragraph 6.4.3

[169] Change of RT Coal Mozambique's Resource and Reserves Statements, page 2 [RT_00471165 to RT_00471174]

[170] For example, Caroline Vilar, Manager, Accounting Policy & Advisory, RTHQ ("**Ms Vilar**"), stated that Deloitte needed to review the revised reserves and resources figures and assess whether the downgrade impacted their PPA conclusions in respect of the value of the RTCM Assets as at the date of the Transaction (Email from Ms Vilar to Mr Wishart (cc: Ms Barbrook and Carrie Foster, Finance Manager - Strategy and Finance, RTE ("**Ms Foster**")), dated 23 January 2012, "*subject: RTCM – reserves & resources*" [RT_00362233 to RT_00362237])

6.5.2 On 25 January 2012, Andrew Nehill, Partner, Corporate Finance, Deloitte ("**Mr Nehill**"), stated[171]:

"*Would we be able to talk to someone who was involved in the resource revision in order to understand the basis for it, particularly the drivers for the decrease? eg, whether there has been a 'fatal flaw' discovered/ operating cost estimates have increased etc. This will be the main consideration for understanding whether the revised resource conversion factors and resource premium factor are defendable*".

6.5.3 In addition, Mr Nehill stated:

"*I also note that Benga's marketable reserves are only 137 Mt (300Mt is prior to 44% yield adjustment); if the resources were subject to a similar yield, they would contribute c. 270Mt production (ie, total of 400 Mt) relative to assumed production of 500Mt. Accordingly, I think a discussion would be worthwhile*".

6.5.4 On 27 January 2012, Dugald Wishart, General Manager, Strategy & Finance, RTE ("**Mr Wishart**") stated that Rio Tinto had discussed with Deloitte the additional work required in relation to the PPA. He also stated:

"[…] *Deloitte* ***do not feel comfortable simply amending their model for the change in resources alone because the cause of the change in R&R is due to cost/quality/mine information subsequent to the acquisition.*** *As RTCM are preparing IC submissions for May/June my view is that all of the cost/quality/mine plan information is still "in progress" and not sufficiently final that we should engage Deloitte to do a fuller review of their attribution*"[172] [emphasis added].

6.5.5 For the purposes of this report, I have assumed that Deloitte's work was then put on hold until later in the first half of 2012, at which point Deloitte were instructed to consider whether the

[171] Email from Mr Nehill to Ms Foster (cc: Mr Wishart), dated 25 January 2012, subject: "*RE: Riversdale–reserves & resources request*" [SEC-DELOITTE-E-0005536 to SEC-DELOITTE-E-0005544]

[172] Email from Mr Wishart to Ms Vilar (cc: Ms Barbrook, Ms Foster and Simon Wensley, Chief Commercial Officer, RTE ("**Mr Wensley**")), dated 27 January 2012, subject: "*RE: RTCM – reserves & resources*" [RT_00362233 to RT_00362237]

updated reserves and resources would impact the PPA. I have identified contemporaneous Rio Tinto correspondence which is consistent with this assumption[173, 174, 175, 176].

6.5.6 I have assumed that Deloitte's work related only to the PPA and would not therefore involve a consideration of the carrying amount of the RTCM Assets subsequent to the date of the Transaction. The output of Deloitte's work was set out in an email dated 31 May 2012, which stated that it was based on the assumption that:

"*there would be **<u>no other change to the forecast cash flows associated with the Mineral Interests</u>** from those assumed in the Report as a result of the resource update. In particular:*

- *no change in the quality of the saleable coal that could be extracted*
- *no change in the per-unit operating, extraction, transport and other costs*
- *no change in the capital expenditure profile of the projects*" [emphasis added][177].

6.5.7 This fundamental assumption is important given the concerns apparently raised by Deloitte in January 2012 relating to updating certain assumptions in its assessment of the fair value of

[173] In an email dated 9 May 2012, Ms Vilar stated: "*We will need a robust argument as to why the write down does not affect the valuation and will need to get Deloitte to review, in order to obtain sign off from them that it does not affect the valuation they gave at acquisition*" (Email from Ms Vilar to Mr Wishart and Simon Morris, General Manager – Business Analysis & Operations Support, RTCM ("**Mr Morris**") (cc: Ms Barbrook, Ms Foster and Pedro Botte, Chief Financial Officer, RTCM ("**Mr Botte**")), dated 9 May 2012, subject: "*RE: Riversdale – accounting for share of Benga*" [RT_00184475 to RT_00184479]). In the same email chain, Ms Barbrook stated: "*We really do need something concrete from Deloitte on this. It was* [sic] *been my understanding that Deloitte would be re-engaged to update their work. PwC place a lot of reliance on them as independent valuation specialists*" (Email from Ms Barbrook to Ms Vilar and Mr Morris (cc: Ms Foster, Mr Botte and Mr Wishart), dated 14 May 2012, subject: "*Re: Riversdale – accounting for share of Benga*" [RT_00184475 to RT_00184479])

[174] In an email dated 31 May 2012, Mr Nehill stated that Deloitte were instructed by Rio Tinto "*to now consider whether Rio Tinto's updated reserve and resource statement issued in December 2011 would materially impact* [Deloitte's] *assessment of the value of the Mineral Rights*" (Email from Mr Nehill to Mr Wishart and Ms Foster, dated 31 May 2012, subject: "*Impact of updated resource statement on Riversdale PPA*" ("**Deloitte's May 2012 Report**") [RT_00332175 to RT_00332178])

[175] In an email dated 24 May 2012, Mr Wishart stated: "*We have now been able to get in touch with Deloitte and talked them through the attached change in RTCM Resource/Reserve and why we believe that this alone would not likely change our view of purchase price allocation as the total ROM t modelled to be consumed in the LOM is still well under the level of Resources. Deloitte is going to review the additional information in light of their previous analysis and send us a note back as to whether they think we should be adjusting the PPA. This note is only in email form unless we would like something more formal (do you want something more formal)*" (Email from Mr Wishart to Ms Vilar and Ms Barbrook (cc: Ms Foster, Mr Botte and Mr Morris), dated 24 May 2012, subject: "*RTCAM: Purchase price allocation*" [RT_00464716 to RT_00464718]

[176] Deloitte's May 2012 Report [RT_00332175 to RT_00332178]

[177] Deloitte's May 2012 Report [RT_00332175 to RT_00332178]

the mineral interests in isolation (see paragraph 6.5.4 above). Further and importantly, as I explain in the remainder of this report, I have assumed that there had been a number of changes to other of the cash flows associated with Benga and Zambeze (including in relation to the quantity of the saleable coal, operating and transport costs, and the capital expenditure profile).

6.5.8 Even if Deloitte's work in May 2012 could[178] be sufficient for the purposes of finalising the PPA process, it is not, in my view, appropriate to rely upon Deloitte's PPA work when specifically considering whether there were indicators of impairment in relation to the carrying amount of the RTCM Assets as at a later reporting date (including in Rio Tinto's 2012 Interim Financial Statements). Specifically, I have assumed that Deloitte's work related only to the fair value of the RTCM Assets as at the date of the Transaction, which is based on the facts and circumstances that existed when the Transaction took place. On this basis, Deloitte's work did not therefore incorporate the facts and circumstances that had arisen after the date of the Transaction, which would need to be incorporated into an assessment of the fair value of the RTCM Assets as at a later reporting date.

6.5.9 The conclusions set out in Deloitte's May 2012 Report were as follows[179]:

(a) with respect to Benga: "*Benga's production assumptions would require utilisation of 100% of reserves and* […] *42% of measured resources (which provides the highest level of resource assurance) or 31% of overall resources. Based on our experience, we would typically not consider such conversion assumptions to be unreasonable*";

(b) with respect to Zambeze: "*Zambeze's production assumptions would require utilisation of 96% of its measured and indicated resources or 77% of its total resources under the updated resource statement. Conversion assumptions of this magnitude would unlikely be considered conservative but may still be considered reasonable if Rio Tinto is of the view that there is scope for additional resource identification and conversion beyond the stated amounts*"; and

(c) overall, "*subject to the assumptions set out above and Rio Tinto's own internal technical assessment of the adequacy of the resource assumptions, we would not expect*

[178] On the basis that the other changes to cash flows (with the exception of quality of saleable coal) could be viewed as being facts or circumstances that did not exist at the date of the Transaction

[179] Deloitte's May 2012 Report [RT_00332175 to RT_00332178]

the updated resource statements to affect our assessment of the value of the Mineral Interests associated with Benga. Whilst less conservative, the production assumptions for Zambeze may also be considered reasonable (subject to technical confirmation)".

6.5.10 Deloitte did recommend, however, that "*Rio Tinto's in-house technical experts assess the continued appropriateness of the volume and yield assumptions under the updated resource statements*"[180].

6.5.11 Whilst Deloitte appear to have concluded, therefore, that they would not expect the downgrading of the reserves and resources to affect the assessed fair value of the mineral properties at the date of the Transaction, there is an apparent circularity to Rio Tinto relying upon this conclusion for the purposes of not undertaking an impairment test in respect of the carrying amount of the RTCM Assets at a later date.

6.5.12 Deloitte's work was not an impairment test and Deloitte also stated that their conclusion in respect of the PPA was provided on the assumption that Rio Tinto still considered the production assumptions underlying the Deloitte PPA Report to be appropriate in light of the updated reserves and resources.

6.6 The reserves and resources of Tete East and Minjova

6.6.1 As explained at paragraph 6.2.2, prior to the Transaction, Rio Tinto's business case for RTCM was based on the construction of the two open cut mines at Benga and Zambeze together with a small operation at Tete East.

6.6.2 Subsequently, during 2011, Rio Tinto appears to have presented a vision for RTCM to the market based on four open cut mines; Benga, Zambeze, Tete East and Minjova[181]. Whilst I have assumed that Tete East and Minjova were included in Rio Tinto's plans for RTCM from September 2011, Rio Tinto reported only the reserves and resources for Benga and Zambeze during the Material Reporting Period[182].

[180] Deloitte's May 2012 Report [RT_00332175 to RT_00332178]
[181] Conceptual Growth Programme, paragraph 4.4.2, page 13 [RT_00325682 to RT_00325791]
[182] The Conceptual Growth Programme stated: "*the current exploration programme is not yet sufficiently advanced to include any resources within the Tete East and Minjova tenements*" (Conceptual Growth Programme, Section 6, page 27 [RT_00325682 to RT_00325791])

6.6.3 Tete East was acquired by way of the Transaction and was included in the original RTCM CGU however Minjova was not. Despite being included in certain of Rio Tinto's plans and calculations of future cash flows for RTCM (as identified in Drewe 1), Minjova was also not formally disclosed as having been added to the RTCM CGU in Rio Tinto's 2011 Annual Financial Statements, 2012 Interim Financial Statements or 2012 Annual Financial Statements.

6.6.4 IAS 36 confirms that CGUs should be identified consistently from period to period unless a change is justified[183]. Where an entity recognises an impairment of a CGU (as Rio Tinto did in its 2012 Annual Financial Statements) and the aggregation of assets for identifying the CGU has changed, IAS 36 requires the entity to disclose in the financial statements the current and former aggregation of the assets and the reasons for changing the way the CGU is identified[184]. On the basis that no such disclosure was provided in Rio Tinto's 2011 Annual Financial Statements, 2012 Interim Financial Statements or Rio Tinto's 2012 Annual Financial Statements, it appears that Minjova was not ultimately transferred to the RTCM CGU.

6.7 Conclusion

6.7.1 By the half-year reporting date for Rio Tinto's 2012 Interim Financial Statements, I have assumed that the following significant events had taken place in relation to the reserves and resources at RTCM:

(a) Rio Tinto had recognised a significant write down to reserves and resources in its 2011 Annual Financial Statements, with reserves written down by approximately 40% and resources written down by approximately 80%;

(b) Rio Tinto had instructed Deloitte to consider whether the updated reserves and resources set out in Rio Tinto's 2011 Annual Financial Statements would materially impact the PPA. Deloitte concluded that they would not impact the PPA, provided there were no other changes to the forecast cash flows. I have assumed that Deloitte

[183] IAS 36, paragraph 72 (**Exhibit C**)
[184] IAS 36, paragraph 130(d)(iii) (**Exhibit C**)

were not instructed to consider whether there was an impact on the carrying amount of the RTCM Assets at any date subsequent to the acquisition date; and

(c) Rio Tinto had presented a vision for RTCM to the market which included a further mine, Minjova, in addition to the three mines (Benga, Zambeze and Tete East) that were included in Rio Tinto's business case for RTCM prior to the Transaction.

6.7.2 In my opinion, the significant write down to the reserves and resources at RTCM should have been included in the consideration of whether there were indicators of impairment in relation to RTCM as at 30 June 2012. For this consideration, it was not appropriate to rely on Deloitte's work in relation to the PPA, which was based on facts and circumstances that existed when the Transaction took place.

7 Significant events relating to the infrastructure required for the coal chain at RTCM

7.1 Introduction

7.1.1 In this Section I set out an overview of the relevant significant events relating to the infrastructure required for the coal chain at RTCM throughout the Material Reporting Period. Where I have cited contemporaneous information and transcripts of witness depositions, I have included these because I consider them to be relevant to the assumptions upon which I have based my consideration of whether there were indicators of impairment in relation RTCM by 30 June 2012. I have assumed, only for the purposes of this report, that the statements within the cited information are true.

7.1.2 I understand that, prior to the Transaction, Rio Tinto identified four key potential options for the transportation of coal from the mines in the Moatize basin to port for export:

(a) the railway line from Sena to the Port of Beira (the "**Sena Line**");

(b) barging down the Zambezi river to Chinde;

(c) a greenfield[185] rail and port solution (likely to Quelimane) (the "**Greenfield Line**"); and

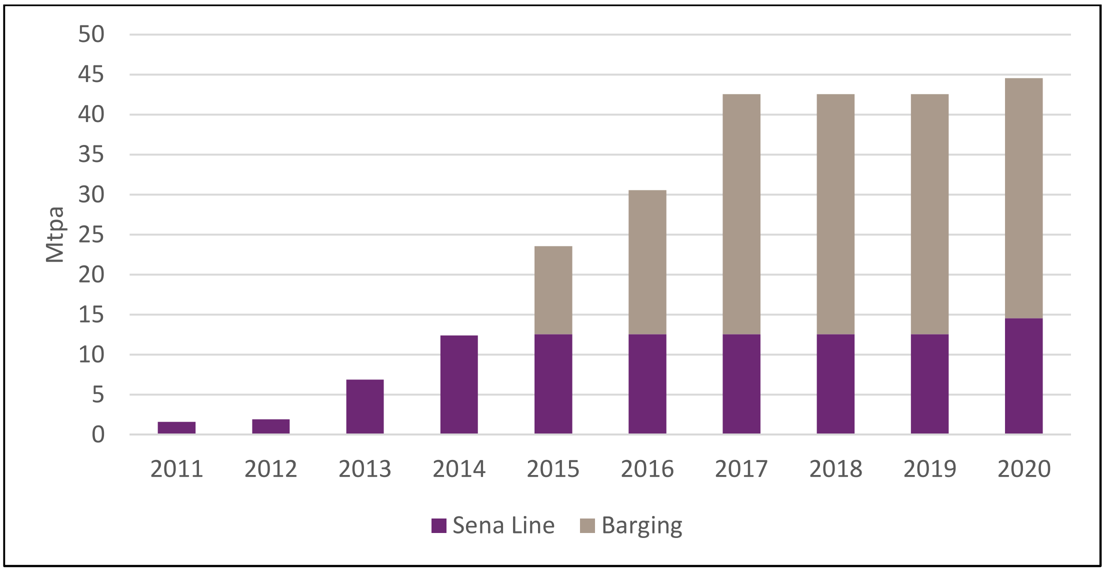
(d) the railway line from the Moatize basin to the Port of Nacala (the "**Nacala Line**").

7.1.3 For the purposes of this report, I have assumed that, prior to the Transaction, Rio Tinto planned that coal would initially be transported using the Sena Line and that barging would subsequently be introduced as a larger scale transport solution. This is consistent with the assumed methods of transportation reflected in the Acquisition Model. In Figure 7A below I illustrate the available coal chain capacity in the first ten years of the operation of RTCM that was recorded in the Acquisition Model[186]:

[185] In her deposition, Helen Newell, Vice President of Infrastructure, RTE ("**Ms Newell**") explained that "*A greenfield project or a greenfield railway is a construction of a project or an asset that is from nothing*" (Ms Newell deposition transcript, dated 27 September 2018, page 52)

[186] I provide my workings in **Appendix H**

Figure 7A: The available coal chain capacity recorded in the Acquisition Model



7.1.4 The method of transportation that would be used for the coal chain at RTCM is important because it impacts:

(a) the quantum of capital expenditure that would be incurred in establishing the transportation options;

(b) the operating cost that would be incurred in transporting each tonne of saleable coal; and

(c) the extent to which the overall capacity of the coal chain would constrain the volume of RTCM's saleable coal that could be transported out of the mines.

7.1.5 For the purposes of my consideration of whether there were indicators of impairment in relation to RTCM by 30 June 2012, I have been asked to contrast Rio Tinto's key acquisition assumptions in relation to the coal chain at RTCM with subsequent assumptions that I set forth in this Section. In this regard, I address each of the four transportation options in turn below, including setting out the assumptions that I have adopted in relation to their capacity, capital cost, operating cost and feasibility. I also provide a timeline of significant events at **Appendix I**.

7.2 The Sena Line

7.2.1 Prior to the Transaction, Rio Tinto assumed that it would use the 570km Sena Line to transport coal to port whilst the barging infrastructure was being constructed[187]. In addition, in the Acquisition Model, Rio Tinto recorded the following in respect of the Sena Line:

(a) the available capacity would reach 12.4 Mtpa by 2014[188];

(b) the operating costs would be approximately US$29.50 per tonne[189]; and

(c) no capital expenditure would be incurred[190].

7.2.2 For the purposes of this report, I have assumed that, subsequent to the Transaction, Rio Tinto was aware of issues in relation to the required upgrade of the Sena Line, including potential constraints to the available capacity, delays to the transportation of first coal and a requirement for Rio Tinto to provide funding for certain of the upgrade work.

[187] See Figure 7A
[188] Acquisition Model, "*logistics*" tab, row 37 [RT_00337763]
[189] Drewe 1, paragraph 11.3.2
[190] Drewe 1, Figure 11C

7.2.3 I have identified a number of contemporaneous documents and statements made by individuals in transcripts from depositions which appear to be consistent with this assumption[191, 192, 193, 194, 195].

7.2.4 I have assumed that, by 30 June 2012, the capacity constraints remained clear and the uncertainty over the potential expansion of the Sena Line was apparent to Rio Tinto. I have identified contemporaneous Rio Tinto correspondence which appears to be consistent with this assumption[196].

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[191] A Rio Tinto presentation dated 5 August 2011 stated that the "*Sena / Beira rail corridor will be constrained to 5-6Mtpa without further upgrades*", compared with Rio Tinto's assumption in the Acquisition Model that it would use 10.1 Mtpa of capacity by 2014 (Rio Tinto Projects in Mozambique, MIREM Co-ordinating Council Meeting, 5 August 2011, slide 9; Acquisition Model, "*logistics*" tab, row 17 [RT_00020650 to RT_00020662], [RT_00337763])

[192] In her deposition, Ms Newell stated that: (i) the Sena Line "*had been destroyed during the civil war in Mozambique*" and "*needed a lot of work to be upgraded both to get to initial use and then also to be potentially expanded for greater use*" ; and (ii) the early estimates for the capacity of the Sena Line were 5Mtpa, of which Rio Tinto could use one third (Ms Newell deposition transcript, dated 27 September 2018, pages 155, 257 and 258)

[193] A September 2011 RTCM Coal Chain Position Paper stated: "*Key developments that have occurred since due diligence include:* [...] *CFM and CCFB lack of capability to complete upgrade of Sena Line, requiring reduction in capacity estimates and requirement for RTCM to fund some upgrade programs to ensure safe and viable operations* [...] *CFM's lack of funds to upgrade port capability to 24 hour operations, requiring RTCM to fund buoyage upgrades (and tugs) to achieve* [...] *Delays in redevelopment of TCC8 berth, requiring delays in first coal movements to early 2012*" (RTCM Coal Chain Position Paper - September 2011, page 1 [RT_00022911 to RT_00022926])

[194] An email from Mr Finlayson to Mike Jolley, Chief Financial Officer, RTCM ("**Mr Jolley**"), dated 17 November 2011 stated: "*The acquisition model assumed 6Mtpa of rail & port capacity in 2012 (RTCM share 1.9Mtpa) with the RTCM share rising to 12.6Mtpa by 2014. The current assumption is that a capacity upgrade from 6Mtpa to 19Mtpa by 2014 proceeds as recently announced by CFM; that there will be intense competition from Vale, Jindal, ENRC and others for the 13Mtpa of extra capacity; and that the RTCM share of the 19Mtpa will be 3Mtpa. Even if there were no other companies competing for capacity and the current 68:32 capacity split with Vale was preserved, the RTCM share of 19Mtpa capacity would be only 6Mtpa*" (Email from Mr Finlayson to Mr Jolley, dated 17 November 2011, subject: "*Can you assist with the highlights?*" [RT_00264574 to RT_00264577])

[195] An email sent by Ms Newell in November 2011 stated: "*The other comments about the Sena Beira upgrade to 19mtpa by 2014 may be what CFM (I cannot recall this but will accept) is saying but I will eat my hat if it comes on that quickly. Some work will be undertaken to get our capacity to 3mtpa by 2014 but the larger volumes are more likely to come on late 2015+*" (Email from Ms Newell to Mr Finlayson and Mr Jolley, dated 18 November 2011, subject: "*RE: Can you assist with the highlights?*" [RT_00264574 to RT_00264577])

[196] An email from Chris Webb, Business Analyst – Future Corridors, RTE ("**Mr Webb**") to Ms Newell dated 4 May 2012 stated: "*A very steep ramp-up on Sena Beira in bid case* [prior to the Transaction] *which is significantly more aggressive than that now contemplated* [...] *10mt max capacity by 2014 on Sena Beira would require a 30mtpa+ system (assuming 32% RTCM). The bid case relies on the First Class Partnership* [external consultants] *work which states that 30mtpa is possible with significant track upgrades and loop lengthening, and perhaps the need for higher axle loads* [...] *Current position is that Beira port capacity is clearly a risk above 8-9mtpa system capacity. I am not sure to what extent that was acknowledged in the bid analysis*" (Email from Mr Webb to Ms Newell, dated 4 May 2012, subject: "*Bid Case reconciliation*" [RT_00341864 to RT_00341868])

7.2.5 In addition to the above-mentioned assumption in relation to capacity constraints, I have assumed that, by 30 June 2012, Rio Tinto's estimated operating costs and capital expenditure in relation to the Sena Line had increased significantly from the costs recorded in the Acquisition Model prior to the Transaction. As referred to at paragraph 7.2.1, Rio Tinto initially recorded that there would be no estimated capital expenditure and estimated operating costs of approximately US$29.50 per tonne. However, I have assumed that the estimate of operating costs had increased to US$50.80 per tonne and the estimated capital expenditure had increased to approximately US$750 million by May 2012[197].

7.2.6 For the purposes of this report, I have assumed that during the Material Reporting Period, when compared with the assumptions in the Acquisition Model, the estimated capacity of the Sena Line decreased, the ramp up of that capacity was delayed, the estimated operating costs nearly doubled and a requirement for significant additional capital expenditure was identified.

7.3 Barging

7.3.1 Prior to the Transaction, Rio Tinto assumed that it would use a 540km stretch of the Zambezi River to barge coal from the Moatize basin to the Port of Chinde, from where it would be transhipped[198] to ocean-going vessels[199]. Rio Tinto stated that this transportation option would "*be technically feasible and cost effective versus rail alternatives*"[200]. In the Acquisition Model, Rio Tinto assumed the following in respect of barging:

(a) the available capacity would reach 30 Mtpa by 2017[201];

(b) the long-term operating costs would be approximately US$14 per tonne[202]; and

(c) US$588 million of capital expenditure would be incurred[203].

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[197] These figures are set out in an email from Mr Webb to Ms Newell, dated 4 May 2012, subject: "*Bid Case reconciliation*" [RT_00341864 to RT_00341868]
[198] Transhipment is the process of off-loading a cargo from one vessel and loading it onto another vessel
[199] Rio Tinto Energy, Investment Committee Paper on the Acquisition of Riversdale Mining, August 2010, page 6 [RT_00008702 to RT_00008716]
[200] Rio Tinto Energy, Investment Committee Paper on the Acquisition of Riversdale Mining, August 2010, page 6 [RT_00008702 to RT_00008716]
[201] Acquisition Model, "*logistics*" tab, row 52 [RT_00337763]
[202] Drewe 1, paragraph 11.3.2
[203] Drewe 1, Mr Drewe's workings underlying Figure 11C

7.3.2 An internal Rio Tinto memorandum dated 13 November 2011 stated that "***Barging is critical to the delivery of the RTCM growth plan*** *and represents potentially significant value when compared with alternate coal chain options*" [emphasis added][204].

7.3.3 For the purposes of this report, I have assumed that, by the end of 2011, Rio Tinto had revised downwards its assumption in relation to the available capacity of barging of 30 Mtpa that was recorded in the Acquisition Model. I have identified a number of contemporaneous documents and statements made by individuals in transcripts from depositions which are consistent with this assumption[205, 206, 207, 208].

7.3.4 For the purposes of this report, I have also assumed that, by the end of 2011, Rio Tinto was aware that its barging proposal had been rejected by the Government of Mozambique. I have

[204] Defendants' Exhibit 3, page 6

[205] A Rio Tinto presentation dated 5 August 2011 referred to "*Ultimate capacity perhaps 20 Mtpa*" (Rio Tinto Projects in Mozambique, MIREM Co-ordinating Council Meeting, dated 5 August 2011, slide 8 [RT_00020650 to RT_00020662])

[206] On 2 September 2011, Rio Tinto submitted an Environmental and Social Impact Assessment ("**ESIA**") to the Ministry for Coordination of Environmental Affairs in Mozambique which I understand was required in order for barging studies to progress further. In an email to Mr Ritchie dated 25 November 2011, Mr Finlayson stated that a maximum capacity of 10Mtpa was reflected in the ESIA submitted in September 2011: "*The acquisition model assumed that barging came on stream in 2015 and ramped up from 11Mtpa in 2015 to 30Mtpa by 2017. The assumption in the 2012-2016 Plan is that barging comes on in 2015 and that a ramp up to 10Mtpa by 2017 is achieved. This is the expected maximum throughput if we follow the model outlined in the barging ESIA. As indicated in an email from Helen, "I believe getting it above that will be extremely challenging but we are proposing a study to consider.""* (Email from Alan Menton, General Manager – Corporate Development, Riversdale ("**Mr Menton (Alan)**") to Mr Woodley, Mr Finlayson and Ms Newell, dated 3 September 2011, subject: "*Barging ESIA Submitted*" [RT_00021735]; Email from Mr Finlayson to Mr Ritchie (cc: Matt Coulter, Director of Energy Business Development, RTE ("**Mr Coulter**"), Mr Wensley, Mr Jolley and Mr Woodley), dated 25 November 2011, subject: "RTCM business valuation" [RT_00237829 to RT_00237833])

[207] In her deposition, Ms Newell stated that 10Mtpa was the working assumption for barging at that time and that there were "*operational constraints that would have made it, we believe, unreliable to look to move more than about 10, using that operating model*" (Ms Newell deposition transcript, dated 27 September 2018, pages 151 to 152 and 157)

[208] Subsequently, the presentation to Mr Albanese and Mr Elliott at a meeting in Brisbane on 11 May 2012 (the "**Final May 2012 Brisbane Presentation**") stated: "*The +30Mtpa barging model assumed in the bid has formidable practical challenges*" (Final May 2012 Brisbane Presentation, page 15 [RT_00278107 to RT_00278133])

identified a number of contemporaneous Rio Tinto documents which are consistent with this assumption[209, 210, 211, 212].

7.3.5 The importance of the barging option for RTCM was stated in various internal Rio Tinto documents which stated:

"*Without barging as an available transport route, many agricultural development opportunities will be unviable and* ***<u>development of the Moatize Basin could be reduced by half current projections</u>*** *as thermal coal export mines are deemed unviable due to the higher transport costs*" [emphasis added][213]; and

"***<u>Barging on River is materially cheaper to build and operate than port and rail, critical for development of thermal coal mines. Without barging, the development of the Moatise Basin will be constrained by as much as half.</u>*** […] *Thermal coal price = US$100/T and expected to decline over time;* ***<u>cannot afford to pay more than $30/T in transport to coast</u>*** *(mining $40/T+, shipping $x/T to Asia).* […] ***<u>Barging cost = $25-30/T Vs greenfield port/rail >$40/T (Nacala >$55/T</u>*** *Source: UBS)*" [emphasis added][214].

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[209] The notes from a meeting between Rio Tinto and Ministry for Coordination of Environmental Affairs in Mozambique on 30 November 2011 stated: "*Most of the reviews were not favourable to barging on the Zambezi River because the negative environmental impacts were considered greater than the economic benefits* […] *The final step was to take it to CONDES council, chaired by the Prime Minister, and the decision made was that the Barging Project SHOULD NOT PROCEED*" (Note of meeting with the Ministry of Environment, dated 30 November 2011, Maputo, pages 1 and 2 [RT_00074947 to RT_00074949])

[210] A report titled "*Mozambique & RSA Coal*", dated November 2011 stated: "*The Environment Ministry indicated verbally on November 30 that the Zambezi River barging ESIA had been rejected* […] *A formal letter of rejection will likely be withheld until after the meeting on December 9 between the Prime Minister and the Chief Executive of Rio Tinto*" (Mozambique & RSA Coal, Monthly Report for November 2011, page 2 [RT_00188736 to RT_00188739])

[211] An email from Mr Finlayson to Mr Coulter, dated 7 December 2011, stated: "*We were informed on November 30 by the Ministry of Environment that the barging ESIA had been rejected* […] *there was always the risk that the cost, environmental or political risks would unwind the barging option. The ESIA also never envisaged 30Mtpa. So the greenfield rail & port option is – and always was – more than just a preference of myself, Helen or anyone else*" (Email from Mr Finlayson to Mr Coulter, dated 7 December 2011 [RT_00237829 to RT_00237833])

[212] A January 2013 RTCM Coal Chain Position Paper stated "*In November 2011, RTCM was advised bluntly that the inclusion of barging in any proposal to GoM would result in the entire proposal being rejected and our reputation being materially damaged within Mozambique*" and "*4Q, 2011, Rejection of Riversdale Barging ESIA and subsequent instruction from President Guebuza's office to cease any fieldwork associated with barging coal down the Zambezi River* […] *and strong pressure to withdraw barging from our Investment Proposal*" (RTCM Coal Chain Position Paper – January 2013, pages 1 and 7) [RT_00079540 to RT_00079546])

[213] Rio Tinto Coal Mozambique, Future Corridors Investment Proposal, dated February 2012, page 7 [RT_00026257 to RT_00026269]

[214] RTCM Key Messages & Communications Strategy - Infrastructure, dated March/April 2012, page 2 [RT_00041393 to RT_00041401]

7.3.6 The above mentioned estimated operating cost for barging of US$25 to US$30 per tonne as at March / April 2012 was nearly double Rio Tinto's estimate of US$14 per tonne prior to the Transaction. In this regard, for the purposes of this report, I have assumed that, before 30 June 2012, Rio Tinto's estimated operating costs for barging had increased to approximately US$30 per tonne, compared with the assumed US$14 per tonne recorded in the Acquisition Model. I have identified a number of contemporaneous documents and statements made by individuals in transcripts from depositions which are consistent with this assumed increase in the estimated operating costs for barging[215, 216, 217].

7.3.7 Notwithstanding my assumptions in relation to the estimated available capacity and operating costs of barging and the Government of Mozambique's rejection of barging, for the purposes of this report I have assumed that Rio Tinto was no longer pursing barging as a transportation option by 30 June 2012. I have identified a number of contemporaneous emails which are consistent with this assumption[218, 219, 220].

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[215] In her deposition, Ms Newell stated the estimated cost of approximately US$30 per tonne was provided by the barging team in the first half of 2012 (Ms Newell deposition transcript, dated 27 September 2018, pages 161 and 162)

[216] A document titled "*Key Messages & Communications Strategy – Infrastructure*" dated January/February 2012 referred to an estimated operating cost of US$25 - US$30 per tonne (RTCM Key Messages & Communications Strategy - Infrastructure, dated January/February 2012, page 3 [RT_00321970 to RT_00321979])

[217] A Rio Tinto presentation titled "*Information Pack – Credit Agricole*" dated 29 March 2012 referred to an estimated operating cost of US$33 per tonne (Rio Tinto Coal Mozambique, Information Pack – Credit Agricole, dated 29 March 2012, page 7 [RT_SEC_00248879 to RT_SEC_00248889])

[218] An email sent by Mr Woodley to Mr Ritchie on 20 April 2012 stated: "*The key messages were very consistent and as follows*
Barging on the Zambeze is most unlikely to occur under the current Government. The Minister for Planning mentioned that the issue was due to political matters with Malawi.
Barging studies should not proceed. The Minister for Planning stated that progressing with barging studies would negatively impact relationships with the Government of Mozambique" (Email from Mr Woodley to Mr Ritchie (cc: Mr Finlayson and Ms Newell), dated 20 April 2012, subject: "*Update on PPP*" [RT_SEC_00084910 to RT_SEC_00084914])

[219] An email from Mr Witthoft to Mark Shannon, Head of Investor Relations, Rio Tinto ("**Mr Shannon**") on 29 May 2012 stated: "*the barging option underlying the acquisition values has been completely abandoned (for now) after strong feedback from the government (i.e. more than one minister speaking out of turn). The clear message to Rio was to abandon the barging idea or lose the right to mine in Mozambique*" (Email from Mr Witthoft to Mr Shannon on 29 May 2012) [RT_00472407 to RT_00472410])

[220] An email from Ms Newell to Mr Finlayson on 5 June 2012 stated: "*Barging study closed due to lack of political support from Govt of Mozambique, and Rio Tinto policy to reduce study costs*" (Email from Ms Newell to Mr Finlayson, dated 5 June 2012, subject: "*FW: CE Report to the Board - input required by no later than Tuesday 5 June*" [RT_SEC_00085799 to RT_SEC_00085802])

7.4 The Greenfield Line

7.4.1 The Greenfield Line was one of the four key transportation options identified by Rio Tinto prior to the Transaction. However, as illustrated in Figure 7A, the Greenfield Line was not included in Rio Tinto's initial plan for transporting coal in the Acquisition Model, which reflected only the use of the Sena Line and barging.

7.4.2 Whilst Rio Tinto's Acquisition Model did not include the use of the Greenfield Line for the coal chain, I have assumed that it became a more significant option for Rio Tinto later in 2011. I have identified contemporaneous documents which are consistent with this assumption[221, 222].

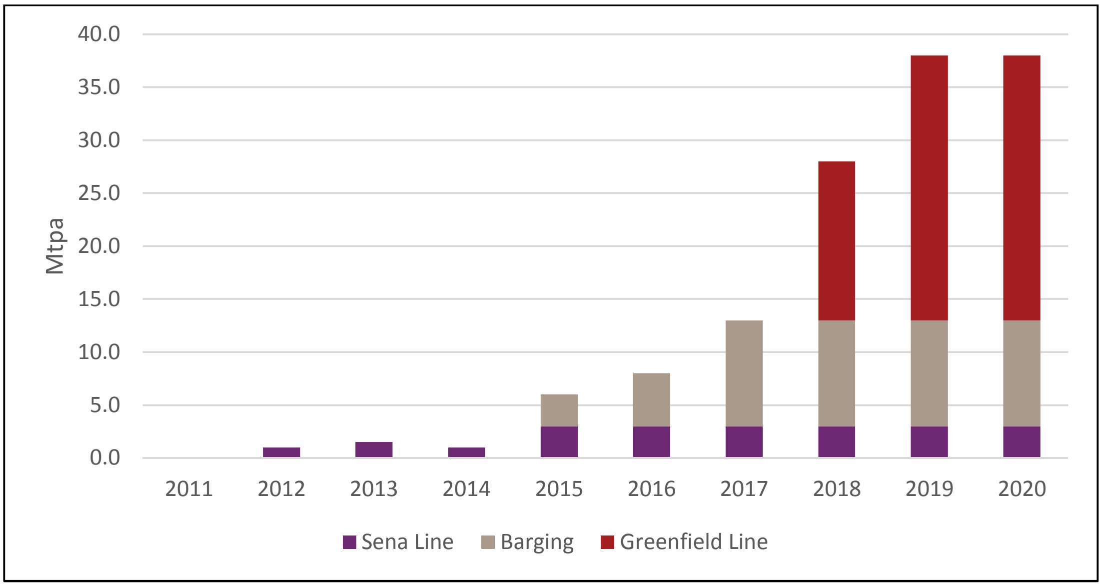
7.4.3 In the graph below, I set out the volume of coal that Rio Tinto recorded as being expected to be transported in the first ten years of the project using each method of transportation according to data set out in the RTCM Oct 2011 Plan Presentation[223]:

[221] A presentation to the RTE Plan Review Committee in October 2011 stated: "*Greenfield solutions will be required to unlock the full coal production potential of the Moatize Basin*" (RTCM Oct 2011 Plan Presentation, slide 3 [RT_00469625 to RT_00469676])

[222] Subsequently, the Final May 2012 Brisbane Presentation stated: "*Other greenfield solutions will be required to unlock the full coal production potential of the Moatize Basin*" (Final May 2012 Brisbane Presentation, page 5 [RT_00278107 to RT_00278133])

[223] I have re-produced the chart titled "*Total Coal Chain Capacity Plan*" on page 38 of the RTCM Oct 2011 Plan Presentation using the data set out on page 50 of the same document ([RT_00469625 to RT_00469676]). It is not clear why the chart on page 38 contains different data to that set out on page 50. However, the data on page 50 is consistent with other pages in the RTCM Oct 2011 Plan Presentation. I provide my workings in **Appendix J**

Figure 7B: The coal chain infrastructure expected by Rio Tinto in October 2011



7.4.4 According to Figure 7B, Rio Tinto was expecting in its Plan Review Committee to utilise the Greenfield Line from 2018.

7.4.5 As referred to in Sections 7.2 and 7.3, I have assumed that Rio Tinto had revised downwards its estimates of the capacity of the Sena Line and barging, which formed the basis of its initial transportation plans recorded in the Acquisition Model. I have assumed that the Greenfield Line was therefore incorporated into Rio Tinto's plans in order to provide additional capacity. This assumption is consistent with internal Rio Tinto correspondence during November 2011 which also stated that this would lead to a US$0.8 billion increase in operating costs when compared with the barging option[224, 225, 226].

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[224] An email from Mr Finlayson stated: "• *The RTCM business valuation assumes that a greenfield rail & port solution comes on stream in 2018 and ramps up to 50Mtpa by 2022. The impact of this solution is that by 2020, annual coal sales will match those forecast in the acquisition model. • As rail transport is more costly than barging and capital charges will be incurred, there will be increased unit costs of transport from 2018*" (Email from Mr Finlayson to Mr Jolley, dated 17 November 2011, subject: "*Can you assist with the highlights?*" [RT_00264574 to RT_00264577])

[225] An email from Mr Jolley stated: "*The lower assumed capacity in barging and the Senna* [sic] *Beira rail line is offset by the Greenfield infrastructure solution which is assumed to come on stream at 15mtpa in 2018, increasing to 50mtpa 2022. As rail is more costly than barging, this increased operating costs accounts for a further $0.8b of the valuation differential*" (Email from Mr Jolley to Mr Wishart and Mr Finlayson, dated 17 November 2011, subject: "*Valuation Comments for Doug*" [RT_00348683 to RT_00348684])

[226] An email Mr Finlayson stated: "*With the barging ESIA being verbally rejected by the Government on November 30 (with a stay of execution until Tom meets the PM), we don't have a business without the greenfield solution*"

7.4.6 For the purposes of this report, I have assumed that the construction relating to the Greenfield Line would require significant levels of capital expenditure (assumed to be in the region of US$5 billion to US$10 billion). I have identified a number of contemporaneous Rio Tinto documents which are consistent with this assumption[227, 228, 229].

7.4.7 In Drewe 1, Mr Drewe identifies that, assuming Rio Tinto would incur the capital cost of building the Greenfield Railway, it estimated that the operating costs of the Greenfield Line would be between US$6.2 and US$9.3 per tonne[230]. Around March 2012, Rio Tinto referred to estimated operating costs for the Greenfield Line of somewhere between US$26 and US$40 per tonne[231], compared with the estimated operating costs for barging around this time of between US$25 and US$30 per tonne[232]. These estimated operating costs for the Greenfield Line appear to be based on another company, "*InfraCo*", building the Greenfield Railway and charging Rio Tinto a fee per tonne.

(Email from Mr Finlayson to Mr Ritchie, dated 6 December 2011, subject: "*Draft letter to Prime Minister*" [RT_00237803 to RT_00237804])

[227] An internal Rio Tinto memorandum dated 13 November 2011 stated: "*The capital cost estimate for this green field coal chain is $4.5 - $5.5B [confirm from GB] for 25mntpa, growing to $8.2B for 100mntpa*" (Defendants' Exhibit 3, page 7)

[228] A Draft Post-Integration Cost Review in March 2012 referred to capital expenditure totalling US$9.5 billion: "*Capex Stage 1 (25mtpa) capex is $6.76bn; Stage 2 (50mtpa) incremental is $887m; Stage 3 (75mtpa)is $1.02bn, and Stage 4 (100mtpa) would be $833m. Total breakeven cost per tonne ramps up massively if volumes do not get to at least 50mtpa on the corridor*" (Rio Tinto Coal Mozambique, Post-Integration Cost Review – Draft, dated 1 March 2012, page 27 [RT_00337139 to RT_00337182])

[229] An RTCM Key Messages & Communications Strategy paper stated: "*Capex to construct channel/barging solution <$1B for 10mtpa Vs. $7-8B for 50mtpa for port/rail*" (RTCM Key Messages & Communications Strategy – Infrastructure, dated March/April 2012, page 2 [RT_00041393 to RT_00041401])

[230] Drewe 1, Section 11.3

[231] Rio Tinto Coal Mozambique, Information Pack – Credit Agricole, dated 29 March 2012, page 7 [RT_SEC_00248879 to RT_SEC_00248889]; paragraph 7.4.7

[232] Paragraph 7.3.6

7.4.8 For the purposes of this report, I have assumed that the capital-intensive nature of the Greenfield Line would have a significant negative impact on the valuation of RTCM. This is consistent with certain contemporaneous Rio Tinto documents and correspondence that I have identified[233, 234].

7.4.9 I have also assumed that, prior to 30 June 2012, Rio Tinto was considering how the Greenfield Line would be funded, including proposing to sell an equity stake and share capacity with other coal companies. This is consistent with a contemporaneous Rio Tinto document that I have identified[235].

7.4.10 With regard to Rio Tinto's search for a partner with whom the Greenfield Line could be developed, I have assumed for the purposes of this report that no agreement had been made by the end of the Material Reporting Period. I have identified a contemporaneous Rio Tinto document which is consistent with this assumption[236].

[233] An email from Mr Finlayson stated: "*The business valuation that we have to claw back from looks ugly - I won't even contemplate giving you the initial number. We have to take large chunks of capital out of the greenfield rail & port (Hatch gave us a $16B number - almost as bad as PDI). All that tells us is that we retained the wrong people to give us an estimate. Helen is going to have to go back ASAP to the Indians and Chinese to get something more sensible*" (Email from Mr Finlayson to Mr Ritchie, dated 22 March 2012, subject: "*IC deferral*" [RT_00239982]). On 16 April 2012 Ms Newell stated that an estimate in the region of US$10 billion to US$12 billion was appropriate (Email from Ms Newell to Mr Ritchie, dated 16 April 2012, subject: "*IC doc and PDI story*" [RT_SEC_00260703 to RT_SEC_00260711])

[234] A Rio Tinto document stated: "*The central case is proven to be too capital intensive in the early years to be viable With initial capital estimates for the revised vision consolidated into a system valuation, the RTCM vision and strategy proves to be value destructive. A Benga-only business case will form the foundation on which to build*" (Rio Tinto Coal Mozambique, Future Corridors - Reinvention required!, dated 15 April 2012, page 2 [RT_SEC_00026390 to RT_SEC_00026395])

[235] The Final May 2012 Brisbane Presentation referred to "*Capacity-sharing with other coal companies*" and stated "*Investigate joint equity ownership in an InfraCo with spare capacity sold to 3rd parties at a margin*". In respect of the coal chain, it also referred to the following "*best configuration from the limited modelling to date*":
"*• 75Mtpa installed capacity through greenfield rail & port*
• 25% equity stake sold to 3rd party at 25% of capital cost
• Spare capacity sold to 3rd parties at $40/t
• Barging excluded
• Existing Sena-Beira rail system used as a bridging solution to 2021"
(Final May 2012 Brisbane Presentation, pages 15, 20 and 21 [RT_00278107 to RT_00278133])

[236] A document attached to an email sent by Mr Woodley on 29 August 2012 stated: "*The largest challenge facing the business is the shortage of coal chain capacity in Mozambique and the current strategy sees RTCM having to construct a Greenfield rail and port system. This path will be highly capital intensive, making it hard to achieve a* [sic] *deliver an NPV-positive business. Alternate partnering and funding options are a near term priority. The principal challenge therefore is to orchestrate—as opposed to build and pay for—the establishment of coal chain infrastructure that can meet the Tete coal province's present and future needs*" (Email from Mr Woodley to Mr Coulter, dated 29 August 2012, Subject: "*RTCM*" [RT_00273392]; Purpose of the RTCM Business Transformation Project, page 1 [RT_00273393 to RT_00273398])

7.5 The Nacala Line

7.5.1 The Nacala Line was a railway line that ran from the Moatize basin to the deep water Port of Nacala, spanning in excess of 900km and cutting across Malawi. The Nacala Line was Vale's primary coal chain solution for its operations in the Moatize basin.

7.5.2 The Nacala Line was not included in Rio Tinto's initial plan for transporting coal in the Acquisition Model, however it appears to have been subsequently considered as a potential short-term transportation option until Rio Tinto's other transportation solutions could be fully utilised. The RTCM Oct 2011 Plan Presentation to the RTE Plan Review Committee in October 2011 referred to the option of "*partnering with Vale on the Nacala option*"[237].

7.5.3 For the purposes of this report, I have assumed that the Nacala Line was not a feasible alternative large-scale transportation option for RTCM during the Material Reporting Period, for example as a result of the estimated operating costs and the timing of its availability. I have identified contemporaneous Rio Tinto documents and / or correspondence which are consistent with this assumption[238, 239, 240].

7.6 Impact of the significant events

7.6.1 In this Section I consider the key assumptions relating to the capacity, capital expenditure requirements and costs of the coal chain reflected in the Deloitte PPA Report and compare these with the updated assumptions that I have identified above. I also consider the impact of the updated assumption in relation to the coal chain transportation solution on the overall economic performance of RTCM.

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[237] RTCM Oct 2011 Plan Presentation, page 3 [RT_00469625 to RT_00469676]

[238] A Rio Tinto document reflected that the estimated operating costs for the Nacala Line of US$55 per tonne as at early 2012 exceeded the maximum of US$30 per tonne that Rio Tinto stated it could afford for thermal coal transportation (RTCM Key Messages & Communications Strategy - Infrastructure, dated January/February 2012, page 3 [RT_00321970 to RT_00321979])

[239] An email from Mr Webb reflected an estimated cost of US$60 per tonne (Email from Mr Webb to Ms Newell, Marc Roberts, Senior Project Consultant, Riversdale ("**Mr Roberts**"), Mr Menton (Alan), Isaac Menton, Barging Analyst – Marine Group, RTCM ("**Mr Menton (Isaac)**"), Greg Britton, Director, Maritime and Waterways, Royal Haskoning ("**Mr Britton**") and Mike Howard, Rail Consultant, RTCM ("**Mr Howard**"), dated 17 April 2012, subject: "*River & Hybrid Modelling*" [RT_SEC_00085346 to RT_SEC_00085350])

[240] An internal memo stated: "*RTCM saw Nacala as potential short term solution (2015 - 2018) while greenfield being built - especially if barging falls over, but now we are being told no access to Nacala until 2018 so may be of no benefit*" (Internal memo, titled "*Potential Infrastructure Sharing with Vale in Mozambique*", dated 30 January 2012, [RT_00026170 to RT_00026174])

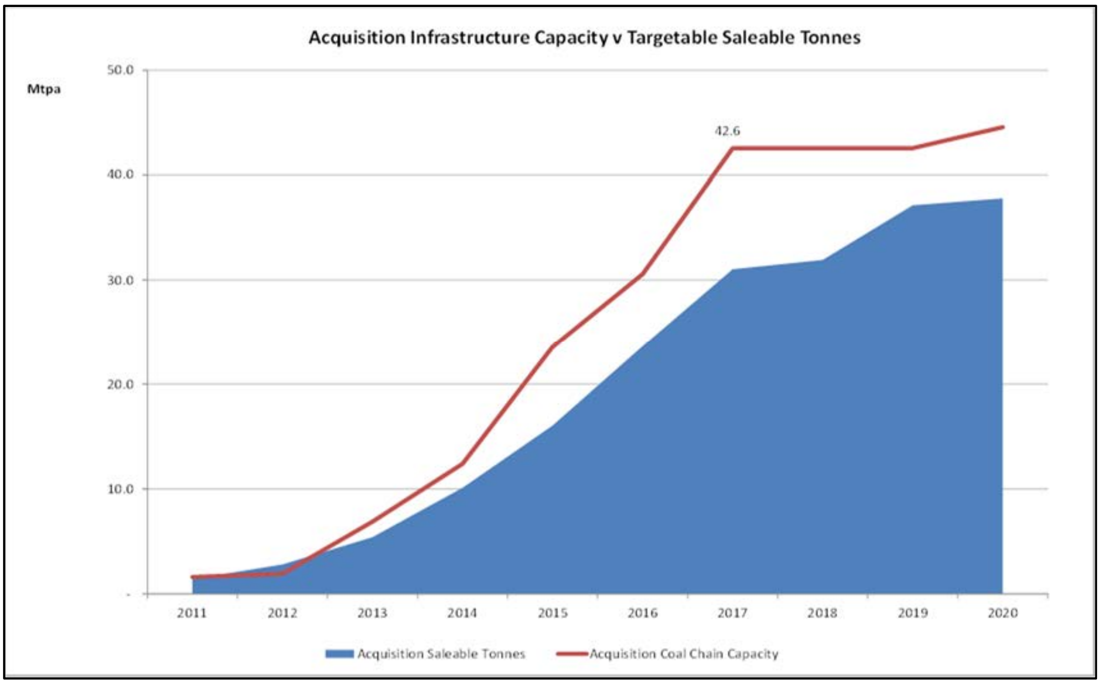
The capacity of the coal chain infrastructure

7.6.2 In the Deloitte PPA Report, Deloitte stated that they had assumed:

"*the Coal Projects will have sufficient access to rail and port infrastructure so as not to impede production*"[241].

7.6.3 This is a critical assumption because, without any capacity constraints, Rio Tinto would be able to export for sale all of the coal produced by RTCM without delay. The graph below, which is taken from the RTCM Oct 2011 Plan Presentation, illustrates this graphically:

Figure 7C: Rio Tinto's analysis of capacity compared with saleable production when assessed as at the date of acquisition[242]



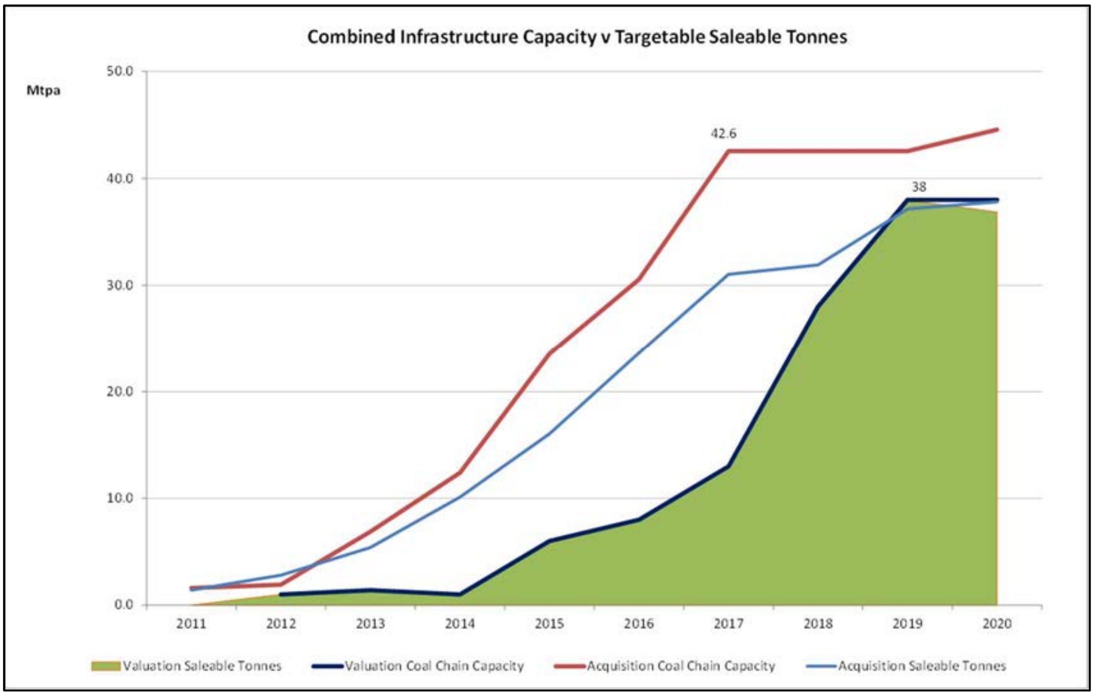
7.6.4 In Figure 7C, the volume of saleable coal being produced (being the area shaded in blue) is less than the capacity of the coal chain infrastructure (being the red line). On this basis, all of the coal produced by the mines could be exported for sale without delay.

[241] Deloitte PPA Report, Section 5.1, page 19 [RT_00180990 to RT_00181048]
[242] RTCM Oct 2011 Plan Presentation, page 49 [RT_00469625 to RT_00469676]

7.6.5 For the purposes of this report, I have assumed that Rio Tinto had identified before 30 June 2012 that the volume of saleable coal would be constrained by the coal chain infrastructure. I have identified contemporaneous Rio Tinto documents and correspondence which are consistent with this assumption[243, 244, 245].

7.6.6 Figure 7C above was then updated in the RTCM Oct 2011 Plan Presentation to demonstrate the impact of the coal chain infrastructure on capacity:

Figure 7D: Rio Tinto's analysis of the constraint of the coal chain on capacity[246]



7.6.7 In Figure 7D, the volume of saleable coal being produced (being the area shaded in green) is constrained by the capacity of the coal chain (being the dark blue line). In the context of assessing the fair value of an asset by reference to a DCF, this is important because it means that certain of the cash flows arising from the sale of coal will be deferred and there will

[243] A Rio Tinto presentation dated 5 August 2011 stated "*Ramp up of production will continue to be constrained due to coal chain capacity limitations unless there is concerted action by the Government and investors*" (Rio Tinto Projects in Mozambique, MIREM Co-ordinating Council Meeting, dated 5 August 2011, page 9 [RT_00020650 to RT_00020662]**)**

[244] In an email dated 13 December 2011 Mr Woodley set out the key points from a visit to Mozambique by Mr Albanese and Mr Elliott, which he stated included that they were "*Very disappointed in the state of the coal chain constraints*" (SEC Exhibit 19, page 2)

[245] The Final May 2012 Brisbane Presentation stated: "*Current coal production is seriously infrastructure-constrained*" (Final May 2012 Brisbane Presentation, page 4 [RT_00278107 to RT_00278133])

[246] RTCM Oct 2011 Plan Presentation, page 48 [RT_00469625 to RT_00469676]

consequently be a greater discount effect on these cash flows. Consequently, the capacity constraints of the coal chain infrastructure reduce the fair value of the RTCM Assets that is computed using the DCF.

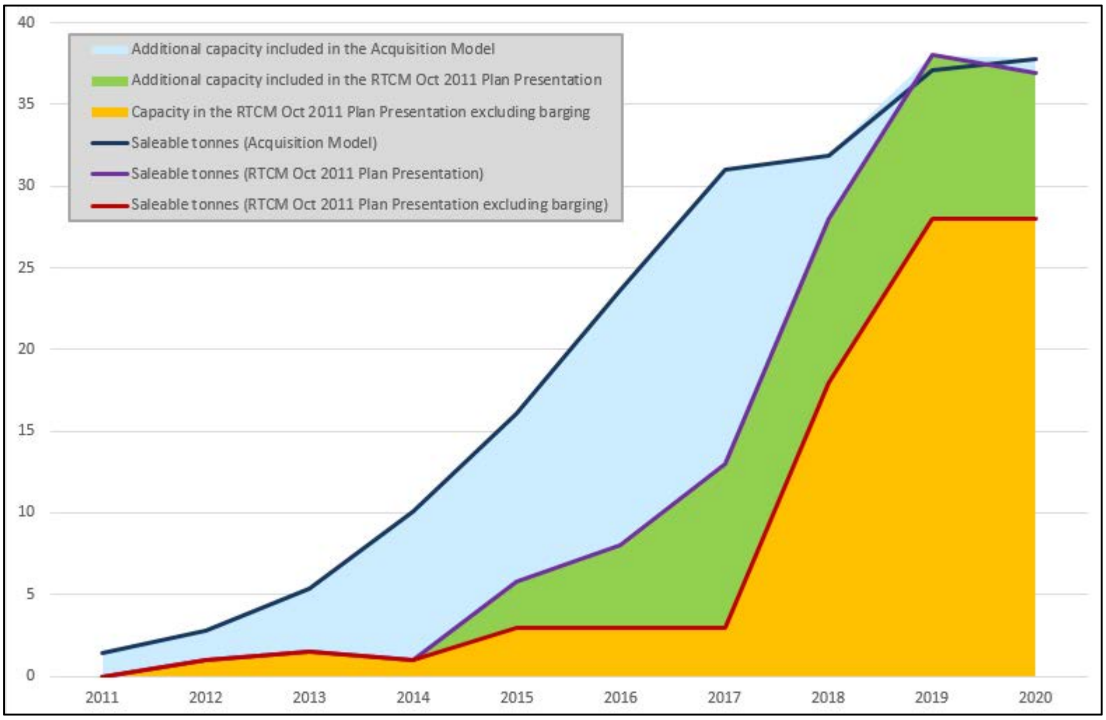
7.6.8 Further and importantly, the assumed rejection of barging by the Government of Mozambique would have compounded these capacity issues. This was because the volumes of production that Rio Tinto had previously estimated would be barged (per the RTCM Oct 2011 Plan Presentation[247]) would now also be transported using the Greenfield Line[248]. Using the data in Figures 7B and 7D above, I set out graphically in Figure 7E below the impact of excluding barging on the capacity of the coal chain infrastructure[249]:

[247] See Figure 7B

[248] For example, in an email dated 13 January 2013, Mr Halliday stated "*No barging also heavily impacted ramp-up volumes and so impact goes well beyond cost*" (email from Mr Halliday to Gary O'Brien, Chief Financial Officer, Diamonds and Minerals Product Group ("**Mr O'Brien**"), dated 13 January 2013, subject: "*RE: Mercury – Board Presentation*" [RT_00189754 to RT_00189757])

[249] My workings are provided in **Appendix K**

Figure 7E: The impact of excluding barging on the capacity of the coal chain infrastructure



7.6.9 It is evident from Figure 7E above that the capacity of the coal chain (the area shaded orange) is significantly further reduced if barging is excluded. This would have led to a further reduction in the computed fair value of the RTCM Assets.

The capital expenditure requirements

7.6.10 The Deloitte PPA Report stated that the projected capital expenditure assumed by Deloitte is:

"*mainly associated with the initial development costs of the mine*[s] […] *and also include an allowance for ongoing maintenance capital expenditure*"[250].

7.6.11 In addition to the significant additional capital expenditure required for the Greenfield Line, I have assumed that Rio Tinto had identified that other capital expenditure assumptions were significantly understated:

(a) as referred to at paragraph 7.2.5, the estimated capital expenditure for the Sena Line was reported to have increased from US$nil to US$750 million; and

[250] Deloitte PPA Report, Section 5.6, page 24 [RT_00180990 to RT_00181048]

(b) a Rio Tinto Monthly Report for March 2012 stated: "*Capital for building the Benga and Zambeze mines is $0.5B higher than in the bid model while Tete East will require an additional $1.3B to construct an open-pit rather than underground mine*"[251].

7.6.12 Therefore, if this expenditure was part of the plan for developing RTCM, I have assumed that there had been a significant increase in the capital expenditure required for RTCM to be operational, which would have led to a reduction in the computed fair value of the RTCM Assets.

Operating costs

7.6.13 The Acquisition Model assumed that the Sena Line would be used at an operating cost of US$29.50 per tonne followed by barging at an operating cost of US$14 per tonne. I have assumed that these estimated operating costs were subsequently increased by Rio Tinto to US$50.80 per tonne and approximately US$30 per tonne respectively. Further, I have assumed that, by October 2011, Rio Tinto had updated its plans to include the Greenfield Line and, during the first half of 2012, further updated its plans to remove the barging option altogether. As referred to at paragraph 7.4.7, Rio Tinto referred to estimated operating costs for the Greenfield Line of between US$26 and US$40 per tonne if another company built it or between US$6.2 and US$9.3 per tonne assuming that Rio Tinto would incur the significant capital cost of building it.

7.6.14 The estimated operating cost for Rio Tinto's only other primary transportation option, the Nacala Line, was reported to be between US$55 and US$60 per tonne during the Material Reporting Period[252].

7.6.15 I have therefore assumed that there had been a significant increase in the estimated operating costs which would have led to a reduction in the computed fair value of the RTCM Assets.

Expected economic performance of RTCM

7.6.16 The assumption that, by 30 June 2012, Rio Tinto was no longer pursuing barging, and had therefore replaced it with an alternative transportation option, would have a negative impact

[251] Mozambique & RSA Coal, Monthly Report For March 2012, page 2 [RT_00188771 to RT_00188775]
[252] Paragraph 7.5.3 (footnotes)

on the economic performance of RTCM as it represented a fundamental change to the planned coal chain infrastructure. Specifically, the alternative option would:

(a) involve both higher capital expenditure and operating expenditure; and

(b) take longer to become operational, thereby delaying the transportation of saleable coal.

7.6.17 This is consistent with a number of contemporaneous emails[253, 254, 255]. An internal Rio Tinto memorandum dated 11 January 2013 stated that the removal of the barging transportation option resulted in "*a significant loss in overall potential business value*"[256].

7.6.18 In Drewe 1, Mr Drewe explains that identifying the impact of the changes in the transportation solutions to be used for the coal chain at RTCM is not straightforward because, for example, changes might impact production volumes as well as operating costs and capital expenditure.

7.6.19 In order to quantify the assumed apparent change in the transportation options to be used for the coal chain, Mr Drewe based his calculation on Rio Tinto's own assessment of the impact of assuming rail in the Acquisition Model rather than barging and stated that, on this basis,

[253] An email from Matthew Halliday, Chief Financial Officer, RTE ("**Mr Halliday**") to Mr Woodley stated "[…] *clearly the loss of barging was significant to value as it deferred ramp-up and significantly lifted capex*" (Email from Mr Halliday to Mr Woodley, dated 30 December 2012, subject: "*RTCM valuation*" [RT_00188124 to RT_00188128])

[254] Mr Finlayson referred to barging in an email dated 15 June 2012 as follows:
"*14 months ago, our task was to implement the bid model. Fourteen months on and the bid model is dead.* […] *the +30Mtpa barging model assumed in the bid began to look more like a super-stretch target than a central estimate of what could be achieved. The 10Mtpa previously assumed by Riversdale looked far more plausible for barging. The change in our view on barging had several profound implications. First was that our production was now constrained by barging capacity. This meant significantly fewer earlier tonnes and a significantly lower NPV. Second, it also meant that to accommodate our planned production growth, other export capacity was now an imperative rather than just an option*" (Email from Mr Finlayson to Melissa Harris, Principal Advisor Human Resources – Energy, RTS ("**Ms Harris**"), dated 15 June 2012, subject: "*RTCM Leadership Meeting*" [RT_00265031 to RT_00265035])

[255] In an email dated 2 January 2013, Ms Newell stated: "*The assumptions made by RT in the DD process re barging (re potential volume, technical ability and opex and capex costs) were mostly unlikely to ever be achieved and inconsistent with our own guidelines on financial treatments (eg what must be capexed or opexed).*
We kept barging studies alive to explore it as a potential low volume solution or as an interim ramp up phase. Clearly the capex and opex unit costs changed materially as did the operational model.
Without the technical knowledge around maintenance dredging, we still may be undercosting this option at $37/T. With the continued strong political opposition to this mode, I believe it would be very unwise to put it in any valuation case as anything other than a potential sensitivity" (Email from Ms Newell to Mr Woodley and Mr Halliday, dated 2 January 2013 [RT_SEC_00095045 to RT_SEC_00095049])

[256] Internal memo, titled "*Rio Tinto Coal Mozambique Impairment Valuation – Update*", dated 11 January 2013, page 1 [RT_00257820 to RT_00257836]

the NPV computed by the Acquisition Model would reduce from US$3,140 million to US$1,637 million[257].

7.7 Conclusion

7.7.1 By the half-year reporting date for Rio Tinto's 2012 Interim Financial Statements, the following events, if they occurred, should have been included in Rio Tinto's consideration of whether there were indicators of impairment in relation to the carrying amount of the RTCM Assets:

(a) in relation to the Sena Line, it was still being pursued as a transportation option in the short-term, however:

(i) the estimated capacity would be constrained to 5 to 6 Mtpa compared with previously assumed capacity usage of 10.1 Mtpa;

(ii) the estimated operating costs had increased from the previous estimate of US$29.50 per tonne to approximately US$50 per tonne; and

(iii) the estimated capital expenditure had increased from nil to approximately US$750 million;

(b) in relation to barging:

(i) the estimated capacity had reduced significantly (from 30 Mtpa to 10 Mtpa);

(ii) the Government of Mozambique had rejected Rio Tinto's proposal relating to a barging solution with a maximum capacity of 10Mtpa and stated that barging should not be included in any of Rio Tinto's future proposals;

(iii) the estimated operating costs had increased from US$14 per tonne to approximately US$30 per tonne;

(iv) Rio Tinto was no longer expecting barging to be the sole long-term transportation solution for RTCM; and

[257] Drewe 1, Section 11.2

(v) ultimately, Rio Tinto was no longer actively pursuing the barging transportation option, which it stated resulted in "*a significant loss in overall potential business value*";

(c) in relation to the Greenfield Line:

(i) Rio Tinto had stated "*we don't have a business without the Greenfield solution*";

(ii) the Greenfield Line was being pursued as the sole long-term transportation solution; and

(iii) significant capital expenditure would be required (in the region of US$5 billion to US$10 billion). Whilst Rio Tinto had begun searching for a funding partner, no agreement had been made by the end of the Material Reporting Period;

(d) Rio Tinto had identified that the volume of saleable coal produced would be constrained by the capacity of the coal chain. This meant that certain of the cash flows arising from the sale of coal would be deferred and there would consequently be a greater discount effect on these cash flows. Consequently, the capacity constraints of the coal chain infrastructure would reduce the fair value of the RTCM Assets that is computed using the DCF. The capacity constraints were further compounded by the rejection of barging by the Government of Mozambique and Rio Tinto's decision that it should no longer be pursued; and

(e) there had been a significant increase in the estimated capital expenditure and operating costs in relation to the coal chain which would have led to a reduction in the computed fair value of the RTCM Assets.

8 Significant events relating to the expected economic performance of the RTCM Assets

8.1 Introduction

8.1.1 In this Section I set out an overview of the significant events relating to the expected economic performance of the RTCM Assets throughout the Material Reporting Period. Specifically, I:

(a) identify the outputs of Rio Tinto's contemporaneous assessments of the value of the RTCM Assets; and

(b) summarise the key reasons for the changes in those assessments.

8.1.2 In this Section I largely rely upon the work undertaken by Mr Drewe, as set out in Drewe 1.

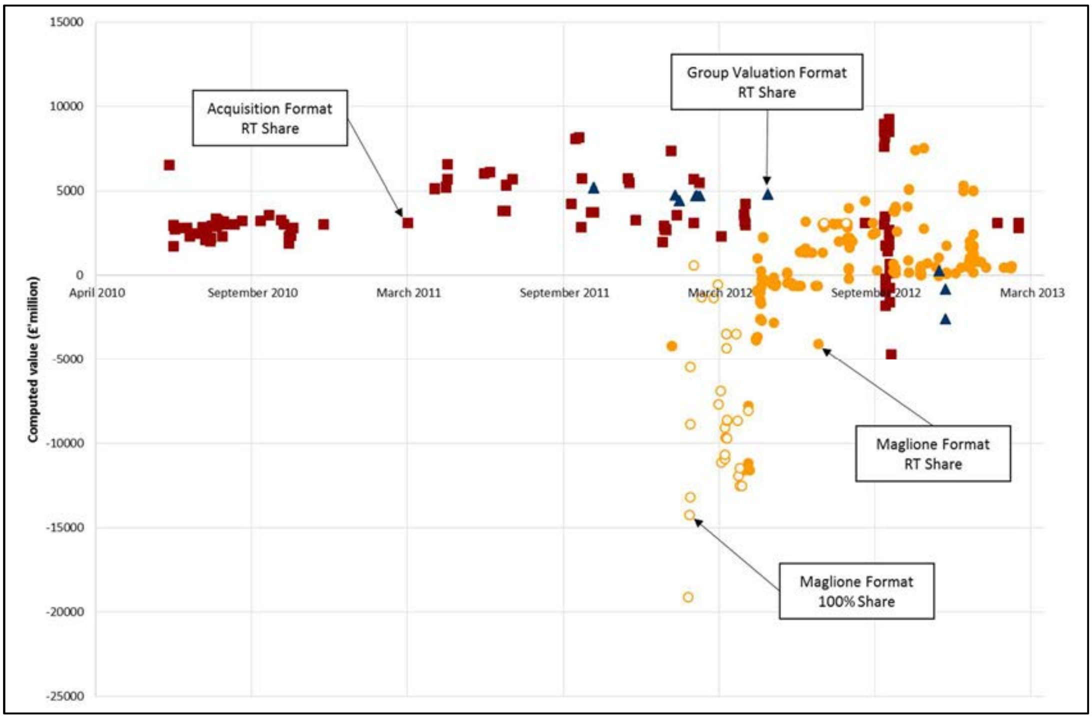
8.2 Outputs of Rio Tinto's assessments of the value of the RTCM Assets

8.2.1 Rio Tinto's PEG (Project Evaluation Guidelines) state that Rio Tinto's basic measure of shareholder value for an asset is the net present value of its expected future cash flows ("**NPV**")[258]. In Drewe 1, Mr Drewe explains that Rio Tinto determined the NPV of assets, investments and projects by reference to a DCF (discounted cash flow) analysis. Mr Drewe also identifies and considers Rio Tinto's contemporaneous assessments of the NPV of the RTCM Assets, as set out in the available DCF models[259].

8.2.2 The graph below, which is taken from Drewe 1, illustrates graphically the computed NPVs for RTCM set out in Rio Tinto's available DCF models:

[258] PEG, Volume 1, page 20, section 5.3 [RT_SEC_00115452 to RT_SEC_00115483]
[259] Drewe 1, Sections 4.6 and 6

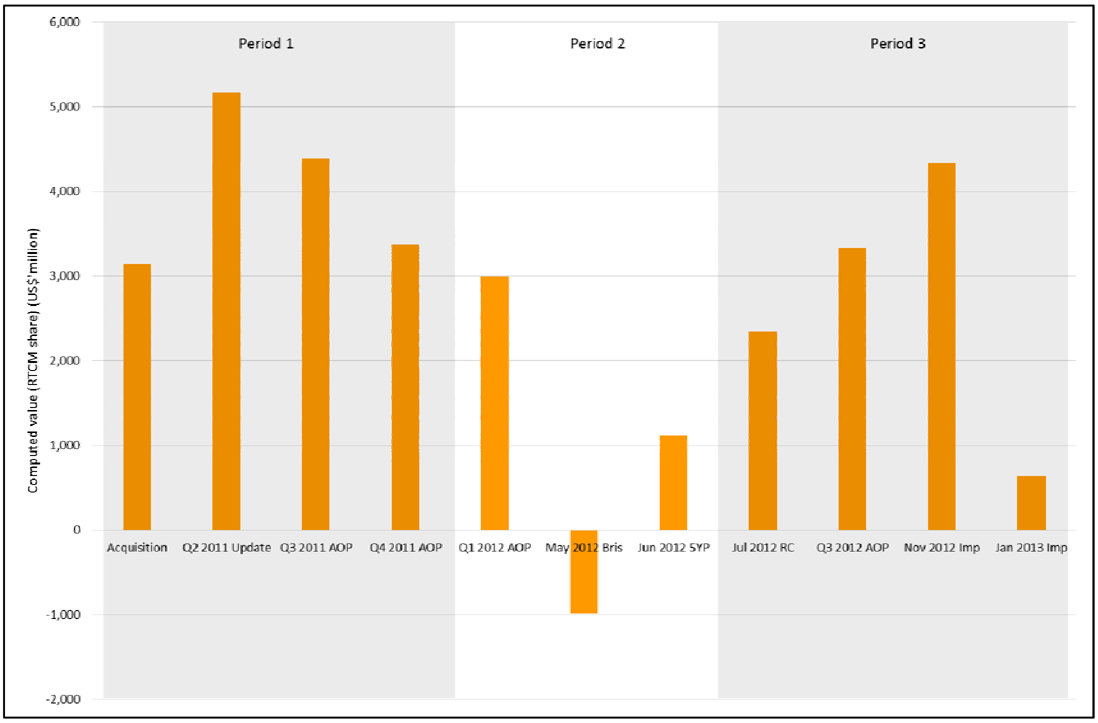
Figure 8A: Drewe 1 summary of the computed values in the available DCF models[260]



8.2.3 From the available DCF models, Mr Drewe identifies a number of "**Key Models**" which are the focus of his work. The graph below, which is taken from Drewe 1, summarises the computed NPVs for RTCM set out in each of the Key Models:

[260] Drewe 1, Figure 6D. In this figure, Mr Drewe has grouped Rio Tinto's available DCF models into different categories for the purposes of his work. Where Mr Drewe refers to "**RT Share**" this is Rio Tinto's share of the future cash flows generated by the RTCM Assets, whereas "**100% Share**" is the total future cash flows generated by the RTCM Assets, irrespective of the percentage owned by Rio Tinto

Figure 8B: The computed NPV in the Key Models (RT Share)[261]



8.2.4 It is evident from Figure 8B that, based on the computed NPVs for RTCM set out in the Key Models, by the half-year reporting date of 30 June 2012 (the end of Period 2 in Figure 8B above) Rio Tinto was expecting the economic performance of the RTCM Assets to be worse than previously envisaged in the Acquisition Model and had even computed a negative NPV (RT Share) in May 2012. Specifically, whilst in the Acquisition Model the computed NPV (RT Share) of the RTCM Assets was US$3.1 billion, this had fallen to US$1.1 billion by 30 June 2012, compared with the carrying amount of the RTCM CGU (excluding cash) in the 2012 Interim Financial Statements of US$3,487 million.

8.2.5 For the purposes of this report I have assumed that, by 30 June 2012, Rio Tinto was expecting the economic performance of the RTCM Assets to be worse than previously envisaged in the

[261] Drewe 1, Figure 6G. "**Period 1**" is the period from the date of the acquisition of Riversdale to 31 December 2011, "**Period 2**" is the period from 1 January 2012 to the half-year reporting date of 30 June 2012 and "**Period 3**" is the period from 1 July 2012 to the impairment in January 2013

Acquisition Model. I have identified contemporaneous Rio Tinto email correspondence which is consistent with this assumption[262, 263].

8.3 Reasons for the changes in Rio Tinto's assessments of the value of the RTCM Assets

8.3.1 In Drewe 1, Mr Drewe explains that he has identified ten key factors which led to the decrease in computed NPV and / or otherwise impacted the NPV of the RTCM Assets between the date of the Transaction and the announcement of the impairment in January 2013.

8.3.2 In Drewe 1, Mr Drewe identifies that the factor with the most impact on the value of RTCM during the six-month period to 30 June 2012 (Period 2) was the cost and profile of the coal chain[264]. I set out my assumptions in relation to the significant events relating to the infrastructure required for the coal chain at RTCM in Section 7 of this report.

8.4 Conclusion

8.4.1 I have assumed that, by the half-year reporting date for Rio Tinto's 2012 Interim Financial Statements, Rio Tinto was expecting the economic performance of the RTCM Assets to be worse than previously envisaged in the Acquisition Model and had even computed a negative NPV (RT Share) in May 2012. In Drewe 1, Mr Drewe identifies that the factor with the most impact on the value of RTCM between the date of the Transaction and the half-year reporting date for Rio Tinto's 2012 Interim Financial Statements was the cost and profile of the coal chain.

8.4.2 In my opinion, if Rio Tinto was expecting the economic performance of the RTCM Assets to be worse than previously envisaged in the Acquisition Model, this should have been included in Rio Tinto's consideration of whether there were indicators of impairment in relation to the carrying amount of the RTCM Assets as at 30 June 2012.

[262] In an email to Mr Finlayson dated 10 May 2012, Mr Woodley stated: "*I have a Benga stand alone value but it will trigger an impairment discussion so not sure how we play this*" (SEC Exhibit 307)
[263] In an email to various individuals at RTE and RTCM dated 17 July 2012, Mr Morris stated: "*While we have been given quite a degree of leniency this time round, I believe it will be a far more invasive process for YE* [the 2012 year-end]. *Tareq will be heavily involved but I am flagging now there could be issues as we will likely be submitting an NPV as part of the IC paper that is less than the acquisition valuation. As such there is a high certainty that this will trigger an impairment*" (SEC Exhibit 212, page 1)
[264] Drewe 1, Figure 7A

9 Should Rio Tinto have undertaken an impairment test in relation to the carrying amount of the RTCM Assets before it published its 2012 Interim Financial Statements?

9.1 Introduction

9.1.1 In this Section, I consider whether Rio Tinto should have undertaken an impairment test in relation to the RTCM Assets before it published its 2012 Interim Financial Statements. I specifically consider the following:

(a) the extent to which the IFRS requirements referred to in Section 5 are impacted when an entity is issuing interim (as opposed to annual) financial statements (**Section 9.2**);

(b) whether, in my opinion, Rio Tinto should have undertaken an impairment test (**Sections 9.3 and 9.4**); and

(c) Rio Tinto's consideration of whether an impairment test should have been undertaken (**Section 9.5**).

9.2 Interim financial statements

9.2.1 Rio Tinto's 2012 Interim Financial Statements state that they were prepared in accordance with IAS 34[265].

9.2.2 IAS 34 confirms that, when preparing interim financial statements, an entity shall apply the same accounting policies as for its annual financial statements[266]. Of particular relevance to my instructions, the illustrative examples section of IAS 34 confirms that the same criteria for impairment testing and the recognition of impairments are to be applied in relation to interim financial statements and that the entity is required to undertake a review for indicators of impairment since the previous annual reporting date to determine whether a detailed impairment calculation is required as at the interim reporting date[267].

[265] Rio Tinto's 2012 Interim Financial Statements, page 40
[266] IAS 34, IN7 (**Exhibit A**)
[267] IAS 34, Illustrative example, paragraphs B35 and B36 (**Exhibit A**)

9.2.3 The Controller's Manual reflects the requirement to assess whether there are indicators of impairment in respect of specific assets or CGUs at both the interim and annual reporting dates[268].

9.2.4 Therefore, interim reporting does not allow an entity to defer or avoid undertaking an impairment test.

9.3 My opinion

9.3.1 In light of the IFRS requirements and on the basis of my assumptions set out in Sections 6 to 8 of this report, in my opinion, Rio Tinto should have undertaken an impairment test in relation to the RTCM Assets before it published its 2012 Interim Financial Statements. The reasons for this are as follows:

(a) pursuant to IAS 36, there were indicators of impairment in relation to the goodwill;

(b) pursuant to IAS 39, there were loss events in relation to the Benga equity accounted unit[269]; and

(c) pursuant to IFRS 6, events existed which were likely to have been an indicator of impairment in relation to the Zambeze E&E Assets.

9.3.2 To the extent that the asset for which an impairment indicator / loss event has been identified does not generate cash inflows that are largely independent from other assets, then the resultant impairment test will be undertaken at the level of the CGU to which the asset belongs.

9.3.3 I address in further detail below the requirement for Rio Tinto to undertake an impairment test as a result of there being indicators of impairment / loss events.

9.4 Existence of indicators of impairment and / or loss events

9.4.1 In Sections 6 to 8 I referred to a number of assumed significant events which took place during the Material Reporting Period. These included events relating to the reserves and resources

[268] Controller's Manual (C350 Interim (Half Year) Accounts), paragraph 4.1; Controller's Manual (C360 Impairment of non-current assets), paragraph 3.1; Controller's Manual (C120 Exploration and Evaluation Costs), paragraph 1.1

[269] IAS 39, paragraph 59 (**Exhibit N**)

and infrastructure required for the coal chain at RTCM which took place prior to the half-year reporting date for 2012, including:

(a) the downgrading of the reserves and resources of the mineral properties;

(b) a number of issues relating to the infrastructure required for the coal chain, including:

(i) the rejection of barging by the Government of Mozambique and Rio Tinto's decision that barging should no longer be pursued, which Rio Tinto ultimately stated resulted in "*a significant loss in overall potential business value*";

(ii) the introduction of the Greenfield Line as Rio Tinto's sole long-term transportation solution, with the required capital expenditure estimated to be in the region of US$5 billion to US$10 billion. Whilst Rio Tinto had begun searching for a funding partner, no agreement had been made by the end of the Material Reporting Period;

(iii) the increase in Rio Tinto's estimates of the capital expenditure and operating costs in relation to the coal chain; and

(iv) the constraint of the coal chain infrastructure on the quantum of saleable coal and the subsequent deferral of cash flows; and

(c) the valuation propositions of RTCM.

9.4.2 I address the above assumptions in turn below, explaining why I consider them to be indicators of impairment and / or loss events in respect of the RTCM Assets included in the 2012 Interim Financial Statements. The significance of these indicators and / or loss events increases when considered collectively.

9.4.3 In my view, the downgrading of the reserves and resources of the mineral properties was:

(a) pursuant to IAS 36, an indicator of impairment in relation to the RTCM goodwill. The Controller's Manual states that the following is an indicator of impairment: "*A material change from the prior year in the estimates of proven and probable ore reserves and*

resources (as reported in accordance with the 'JORC Code') included within the current mine plan, other than a reduction through depletion"[270];

(b) pursuant to IAS 39, a loss event in relation to the Benga equity accounted unit[271]; and

(c) pursuant to IFRS 6, likely to have been an indicator of impairment in relation to the Zambeze E&E Assets, subject to "*sufficient data*" existing which indicated that the E&E Assets were unlikely to be recovered in full[272]. I comment upon the sufficiency of data at paragraphs 9.4.9 to 9.4.12 below.

9.4.4 It would not have been appropriate to rely on Deloitte's work in connection with the PPA when determining whether the downgrade represented an indicator of impairment in relation to the carrying amount of RTCM as at 30 June 2012. A PPA is based only on facts and circumstances that exist at the date of an acquisition and does not reflect any subsequent events.

9.4.5 In my view, the issues relating to the infrastructure required for the coal chain were:

(a) pursuant to IAS 36[273] and the Controller's Manual[274], indicators of impairment in relation to the RTCM goodwill. For example, they represented significant changes in relation to the manner in which the RTCM assets would be used / were expected to be used, which would have an adverse effect on the entity. Furthermore, they would result in the cash required to operate and / or maintain the assets being significantly higher than previously estimated by Rio Tinto during the acquisition process;

(b) pursuant to IAS 39, loss events in relation to the Benga equity accounted unit[275]; and

(c) pursuant to IFRS 6, likely to have been indicators of impairment in relation to the Zambeze E&E Assets, subject to "*sufficient data*" existing which indicated that the

[270] Controller's Manual (C360 Impairment of non-current assets), paragraph 3.3(b)
[271] IAS 39, paragraph 59 (**Exhibit N**)
[272] IFRS 6, paragraph 20 (**Exhibit H**)
[273] IAS 36, paragraphs 12 and 14 (**Exhibit C)**
[274] Controller's Manual (C360 Impairment of non-current assets), paragraph 3.2
[275] IAS 39, paragraph 59 (**Exhibit N**)

E&E Assets were unlikely to be recovered in full[276]. I comment upon the sufficiency of data at paragraphs 9.4.9 to 9.4.12 below.

9.4.6 Notwithstanding that the key reasons for the decline in the expected financial performance of RTCM are indicators of impairment and / or loss events in their own right, in my view, Rio Tinto's contemporaneous assessments of the value of the RTCM Assets were also:

(a) pursuant to IAS 36[277] and the Controller's Manual[278], indicators of impairment in relation to the RTCM goodwill. For example, they indicated that:

(i) the economic performance of the RTCM Assets would be worse than previously estimated;

(ii) the cash required to operate / maintain the assets would be significantly higher than previously estimated;

(iii) the actual and / or budgeted cash flows and profit / loss flowing from the RTCM Assets would be significantly worse than previously estimated; and

(iv) the RTCM Assets would potentially incur overall operating losses or net cash outflows;

(b) pursuant to IAS 39, loss events in relation to the Benga equity accounted unit on the basis that there was a decrease in the estimated cash flows from the asset[279]; and

(c) pursuant to IFRS 6, likely to have been indicators of impairment in relation to the Zambeze E&E Assets, subject to "*sufficient data*" existing which indicated that the E&E Assets were unlikely to be recovered in full[280]. I comment upon the sufficiency of data at paragraphs 9.4.9 to 9.4.12 below.

9.4.7 Rio Tinto's Wells Submission suggests that no reliance can be placed on these contemporaneous assessments of the value of the RTCM Assets on the basis that they were[281]:

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[276] IFRS 6, paragraph 20(d) (**Exhibit H**)
[277] IAS 36, paragraphs 12 and 14 (**Exhibit C**)
[278] Controller's Manual (C360 Impairment of non-current assets), paragraph 3.2
[279] IAS 39, paragraph 59 (**Exhibit N**)
[280] IFRS 6, paragraph 20(d) (**Exhibit H**)
[281] Rio Tinto's Wells Submission, page 20

(a) "*generated through internal planning models that were intended to evaluate various infrastructure alternatives early in the life of the project*"; and

(b) "*simply not determinative of value*".

9.4.8 However, in my view, in the absence of other information or information to the contrary (neither of which I have identified from my review of the available evidence), these assessments were evidence from Rio Tinto's internal reporting and therefore, whilst not specifically prepared for the purposes of an IAS 36 impairment test, were relevant to the identification of an impairment indicator.

The existence of "*sufficient data*"

9.4.9 As I explain in Section 5.3 above, the impairment indicator requirements contained in IFRS 6 differ from and are stricter than the requirements of IAS 36. In particular, one of the indicators of impairment set out in IFRS 6 is that:

"*sufficient data exist to indicate that, although a development in the specific area is likely to proceed, the carrying amount of the exploration and evaluation asset is unlikely to be recovered in full from successful development or by sale*"[282].

9.4.10 Whether "*sufficient data*" existed to indicate that the carrying amount of an E&E Asset was unlikely to be recovered in full is a matter of judgement. However, it is likely to depend, at least in part, on the stage of development of the mine.

9.4.11 I understand that Zambeze, which was by value the most significant of the E&E Assets, was in the pre-feasibility phase of mine development during the Material Reporting Period[283]. The Controller's Manual states that assets in this phase are classified by Rio Tinto under "Evaluation"[284], which involves the detailed economic assessment of deposits that were identified during the earlier "Exploration" stage.

9.4.12 Mr Drewe confirms in his report that valuations for Zambeze were included in all of Rio Tinto's Key Models which were prepared prior to the half-year reporting date of 30 June

[282] IFRS 6, paragraph 20 (**Exhibit H**)
[283] Deloitte PPA Report, page 12 [RT_00180990 to RT_00181048]
[284] Controller's Manual (C120 Exploration and Evaluation Costs), paragraphs 2.2 and 2.3

2012[285]. Based on the existence of these valuations, I consider it reasonable to assume that Rio Tinto had access to "*sufficient data*" in relation to Zambeze and should therefore have used this data to assess whether there was an indication that the carrying amount of Zambeze included in Rio Tinto's 2012 Interim Financial Statements was unlikely to be recovered in full.

9.5 Rio Tinto's consideration of whether an impairment test should be undertaken

9.5.1 Rio Tinto sets out its position in respect of the 2012 half-year impairment review in its Wells Submission. In this regard, Rio Tinto states that each business unit submitted a briefing paper to the Controllers which included a review for potential indicators of impairment and that the Controllers then considered whether there were any indicators of impairment in accordance with IFRS. Rio Tinto then states that:

"*Ultimately the controllers agreed with RTCM/RTE management that, given all the uncertainties about transportation, there was not a sufficient basis to conclude that there was an impairment indicator*"[286].

9.5.2 The HY 2012 Impairment Review Paper (an internal memo from RTE to the Controllers) appears to be the briefing paper referred to by Rio Tinto in its Wells Submission. In the HY 2012 Impairment Review Paper, Rio Tinto stated whether it considered that there were indicators of impairment in relation to the RTCM Assets in respect of Rio Tinto's 2012 Interim Financial Statements[287]:

"*Overall, we do not believe that there is an impairment indicator. We acknowledge that there is uncertainty over future transportation; however whilst we are confident of finding a viable infrastructure path the breadth of the options mean that a central case view is still under development*"[288].

9.5.3 In its conclusion, Rio Tinto also referred to a number of factors which it claims could have mitigated to a certain extent the impact of a decline in the assessed fair value of the RTCM Assets arising as a result of the development of an alternative transport option.

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[285] Drewe 1, Figure 10A
[286] Rio Tinto's Wells Submission, page 10
[287] HY 2012 Impairment Review Paper [RT_00225317 to RT_00225323]
[288] HY 2012 Impairment Review Paper, page 4 [RT_00225317 to RT_00225323]

9.5.4 In light of Rio Tinto's comments in its Wells Submission and the HY 2012 Impairment Review Paper, I consider below the extent to which the IFRS requirements set out at Section 5 above are impacted in circumstances where:

(a) there is uncertainty; and

(b) there are what might be termed "mitigating factors".

Uncertainty

9.5.5 In a "*Paper on Accounting Issues*" dated 18 June 2012 (the "**June 2012 Paper on Accounting Issues**"), Rio Tinto referred to the existence of "*potential indicators for the need to consider impairment*" in relation to Rio Tinto's 2012 Interim Financial Statements[289]. Rio Tinto refers to this in its Wells Submission and to its contemporaneous conclusions that[290]:

(a) "*there was insufficient certainty to conclude that an impairment trigger existed*";

(b) "*it is not expected that any impairment will need to be recorded as it is too early to assess the impact of the developments on the fair value of the projects*"; and

(c) "*it was premature to reach definitive conclusions prior to a full consideration and evaluation of options*".

9.5.6 IAS 36 provides only very limited circumstances where an entity is permitted not to undertake an impairment test despite having identified the existence of an indicator of impairment. Specifically, IAS 36 confirms that an asset's recoverable amount does not need to be re-calculated if[291]:

(a) the assets and liabilities of the item being assessed have not changed significantly since the previous calculation was prepared; and

(b) a previous calculation shows that the recoverable amount:

[289] June 2012 Paper on Accounting Issues (SEC Exhibit 520 used in the deposition of Richard Hughes, Partner, Assurance, PwC ("**Mr Hughes**") on 21 May 2019)
[290] Rio Tinto's Wells Submission, pages 11 and 23
[291] IAS 36, paragraphs 15 and 99 (**Exhibit C**)

(i) is not sensitive to the identified indicator/(s) of impairment; or

(ii) is significantly higher than the carrying amount of the asset in the entity's financial statements and no events have taken place that would eliminate this difference. In this regard, IAS 36 specifically confirms that the likelihood of the result of the recoverable amount calculation being lower than the carrying amount must be remote.

9.5.7 The determination of whether an asset's recoverable amount needs to be re-calculated incorporates the concept of materiality, which determines the relevance of information to an entity's financial statements based on its nature and / or magnitude. Ultimately, information is considered to be material if its omission or misstatement could influence the decisions of users of the entity's financial statements[292].

9.5.8 Importantly, IAS 36 does not refer to the existence of uncertainty being a permissible reason for delaying or avoiding an impairment test and, likewise, the relevant provisions of IAS 28 do not refer to uncertainty.

9.5.9 The Conceptual Framework confirms that financial information must be a faithful representation of what it purports to represent, meaning it is, to the extent possible, complete, neutral and free from error[293]. The financial information must therefore include the necessary information to enable a user to understand what is being presented and must not be manipulated in any way to increase the probability of it being received favourably or unfavourably by a user[294].

9.5.10 Of particular relevance, the Conceptual Framework explains that the estimate of an impairment to an asset's carrying amount "*can be a faithful representation if the reporting entity has properly applied an appropriate process, properly described the estimate and explained any uncertainties that significantly affect the estimate*". Further, it confirms that, even in circumstances where there is a high level of uncertainty, an estimate may still provide

[292] Conceptual Framework, QC11 (**Exhibit B**)
[293] Conceptual Framework, paragraphs QC4 and QC12 (**Exhibit B**)
[294] Conceptual Framework, paragraphs QC13 and 14 (**Exhibit B**)

the best available information if there is no alternative information which provides a more faithful representation[295].

9.5.11 The existence of uncertainty cannot in my view be used to avoid an impairment test. If negative developments have occurred which will have an impact on the previously produced cash flow forecasts which underlie a carrying amount in the financial statements, the risk associated with those cash flows has increased. This is the case irrespective of whether the negative developments may ultimately be resolved in the future. In this regard, in Section 5.5 of this report I refer to a number of examples of impairments recognised by entities operating in the mining industry. One of these examples (set out at **Appendix E**) is an impairment of US$3.8 billion recognised in the 2012 Annual Report of Barrick Gold Corporation as a result of the "*inability to realize the potential we* [Barrick Gold Corporation] *saw in this asset in the short term*" despite there being "*exceptional future potential*".

9.5.12 As I explain Section 9.4 above, a number of assumed negative developments had occurred in respect of RTCM by the 2012 half-year reporting date. For example, the cash flow forecasts underlying the carrying amount of the RTCM Assets in Rio Tinto's 2012 Interim Financial Statements were based on an assumption that barging would be the long-term and large-scale transportation solution for RTCM. However, in Q2 2012, Rio Tinto stopped pursuing barging as a transportation option. As set out in the assumptions in Section 7 of this report, Rio Tinto had identified that the remaining transportation options (for example, the Greenfield Line) would result in higher operating costs and / or capital expenditure than barging. Further, it had also identified that, without barging, there would be a significant impact on the capacity of the coal chain infrastructure which would lead to a further reduction in the fair value of the RTCM Assets.

9.5.13 An impairment test should be undertaken even if, as a result of uncertainty, it is only possible to undertake the test using a number of best estimates as inputs or on a risk-weighted basis to

[295] Conceptual Framework, paragraph QC16 (**Exhibit B**)

reflect the level of uncertainty. I have identified contemporaneous Rio Tinto email correspondence which appears to be consistent with this position[296, 297].

9.5.14 In his deposition, Marcantonio Maglione, Manager, Business Analysis, RTCM ("**Mr Maglione**") stated that, if he was provided with guidance on the scenario/(s) to be modelled, there was a model in place as at June 2012 that could have been used to provide a valuation output for RTCM[298].

9.5.15 Further, Rio Tinto appears to have recently adopted the above approach in relation to its Oyu Tolgoi underground project in Mongolia. Specifically, as referred to at **Appendix E**, in July 2019 Rio Tinto announced that, although the mine design, cost estimates and schedules for the project were still being developed and would not be delivered until 2020, it would review the carrying amount of its investment as at the 30 June 2019:

"*As previously advised, enhanced geotechnical information and data modelling suggests that there may be some stability risks identified with the approved mine design and so **a number of other mine design options are also under consideration** to complete the Project.* […]

Given the further technical work which is needed, the Definitive Estimate, which will include the final estimate of cost and schedule for the remaining underground project, is now expected to be delivered in the second half of 2020*, reflecting the preferred mine design approach.*

[296] In an email dated 28 May 2012, Mr Witthoft stated:
"*We have had some more discussions here this morning and our latest thinking is that:*
• It seems very likely that we will need to raise the change in circumstances to the Group Audit Committee (mid-June) as a possible impairment trigger.
• In order to assess whether any further detailed work needs to be undertaken we will have to provide some sort of articulation and quantification of the options. I appreciate that accurate figures are not available, but the best high level estimates will have to be used and probability weighted – even if they are to the nearest billion dollars.
• Depending on the magnitude of any potential shortfall between book value and estimated fair value we may have to do further work either to support the book value or calculate a shortfall to write off" (Email from Mr Witthoft to Mr Wishart (cc: Ms Barbrook *et al*), dated 28 May 2012, subject: "*Riversdale update*" [RT_00472407 to RT_00472410])

[297] In an email dated 12 June 2012, Ms Vilar stated: "*I appreciate that the options are not accurately quantified but we do need to give some estimate of values and even probabilities if possible. It would be useful to include something from the Q2 forecast when that is available and a more detailed articulation of the options and stage of their consideration etc. in an appendix*" (Email from Ms Vilar to Mr Wishart, dated 12 June 2012, subject: "*Riversdale update*" [RT_00464798 to RT_00464808])

[298] Mr Maglione deposition transcript, dated 11 October 2019, page 129

All options under consideration present a pathway to sustainable first production, and have different cost and schedule implications. To date, these have been defined to a level of accuracy associated with a Conceptual Study or Order of Magnitude Study, and, therefore, significantly more work is required to complete the final assessment. […]

The company will continue to focus on minimising the impact to project schedule and cost, as it works through the detailed analysis and testing of each mine design option. ***Although further work is necessary to reach definitive conclusions, Rio Tinto is reviewing the carrying value of its investment in the Project and will announce if any changes are required, in the half year results on 1 August 2019***" [emphasis added].

9.5.16 Subsequently, in its half-year results to 30 June 2019 Rio Tinto ultimately stated that it had undertaken an impairment test and had "*concluded that the changes to project cost and schedule led to an impairment charge, net of tax and non-controlling interests, of $0.8 billion*"[299].

9.5.17 It is clear to me that the existence of uncertainty does not allow an entity to defer or avoid undertaking an impairment test.

Mitigating factors

9.5.18 In the conclusion section of the HY 2012 Impairment Review Paper, Rio Tinto referred to a number of factors which it claims could have mitigated to a certain extent the impact of a decline in the assessed fair value of the RTCM Assets arising as a result of the development of an alternative transport option. These mitigating factors included the following:

(a) potential discovery of additional ore reserves:

"*Subsequent drilling results on the neighbouring exploration lease ("Minjova") previously held by Rio Tinto Exploration has indicated that significant additional product tonnes could be delivered by RTCM. This would add value through the extension of the business' operating life and would make any rail and port construction more cost effective*"[300];

[299] Rio Tinto's 2019 Interim Results issued on 1 August 2019, page 1
[300] HY 2012 Impairment Review Paper, page 2 [RT_00225317 to RT_00225323]

(b) potential for extracting methane:

"*It is also believed that extraction of coal bed methane may be viable and represent a significant economic opportunity*"[301]; and

(c) an increase in the forecasted selling price of coal in accordance with Project Evaluation Guidelines ("**PEG**"):

"*Post acquisition the market outlook, and hence price, for the commodities acquired has improved*"[302].

9.5.19 On this basis, in the HY 2012 Impairment Review Paper, Rio Tinto stated:

"*Based on the acquisition operating assumptions, updated for current* [coal prices] *would provide a value that is in excess of the carrying amount. There would be a further upside based on Rio Tinto's view on long-term commodity price and the inclusion of additional mines, and therefore product tonnes, to the RTCM portfolio.* ***Any increase in value from these factors should offset any potential loss resulting from the development of an alternative transport option***" [emphasis added][303].

9.5.20 In the context of identifying an asset that may be impaired, the Controller's Manual states that several "*changes should also be considered*" which include the following:

"*A material change from the prior year in Rio Tinto's long run price assumption for the products of the CGU that is* ***not mitigated by a similar offsetting change in exchange rates, input prices or other factors***"[304] [emphasis added].

9.5.21 The existence of mitigating factors could ultimately mean that an entity is not required to recognise an impairment, despite the existence of indicators of impairment. However, in order for the entity to conclude in this regard it is necessary for the entity to undertake the impairment test. Importantly, the purpose of an impairment test is not only to quantify the amount of an impairment that is known to exist, it is also to determine whether an impairment may exist. As I identify in paragraph 9.5.6, IAS 36 requires the likelihood of the recoverable

[301] HY 2012 Impairment Review Paper, page 2 [RT_00225317 to RT_00225323]
[302] HY 2012 Impairment Review Paper, page 3 [RT_00225317 to RT_00225323]
[303] HY 2012 Impairment Review Paper, page 4 [RT_00225317 to RT_00225323]
[304] The Controller's Manual (C360 Impairment of non-current assets), paragraph 3.3(a)

amount being less than the carrying amount to be "*remote*" in order for an entity to rely upon a previous impairment test calculation.

9.5.22 In **Appendix E** I set out examples of impairments recognised by entities operating in the mining industry. In a number of these examples the entity had identified potential mitigating factors, however an impairment test was still undertaken in order to assess the recoverable amount. For example, in its 2011 Annual Report, BHP Billiton recorded an impairment to previously capitalised exploration and evaluation expenditure, explaining:

"*Exploration drilling activity was delayed in the Gulf of Mexico due to new regulatory permitting processes, but was partially offset by an increase in the acquisition and processing of geophysical data*".

9.5.23 The delay in drilling activity was an indicator of impairment which required an impairment test to be undertaken. The increase in the acquisition and processing of geophysical data and the delay in drilling activity were then offset against each other to a certain extent when identifying the amount of the required impairment.

9.5.24 Similarly, in its 2012 Annual Report, Barrick Gold Corporation referred to an impairment review that was undertaken following the occurrence of events which had both a positive and negative impact on the estimated economic performance of a copper mine:

"*While we increased reserves and defined significant new mineralization at Lumwana in 2012, the mining costs in the new life-of-mine plan were higher than anticipated*"[305].

9.5.25 In circumstances where both positive and negative developments were identified, Barrick Gold Corporation undertook an impairment review to determine whether there was an impairment.

9.5.26 The existence of "mitigating factors" does not allow an entity to defer or avoid undertaking an impairment test.

[305] Barrick Gold Corporation 2012 Annual Report, page 8

9.6 Conclusion

9.6.1 In this Section I consider whether Rio Tinto should have undertaken an impairment test in relation to the RTCM Assets before it published its 2012 Interim Financial Statements. In light of the IFRS requirements and my conclusions in relation to the reserves and resources, coal chain and expected economic performance of RTCM, in my opinion, Rio Tinto should have undertaken an impairment test because there were indicators of impairment / loss events in relation to the goodwill, the Benga equity accounted unit and the Zambeze E&E Asset. Specifically, based on the assumptions set out earlier in this report, by 30 June 2012 Rio Tinto had:

(a) recognised a significant downgrade to the reserves and resources of the mineral properties at RTCM;

(b) experienced a number of fundamental issues relating to the infrastructure required for the coal chain; and

(c) generated assessments of the value of the RTCM Assets which indicated, for example, that the economic performance of the RTCM Assets would be worse than previously estimated.

9.6.2 The significance of these indicators and / or loss events increases when considered collectively.

9.6.3 In its Wells Submission, Rio Tinto referred to "*uncertainties about transportation*" but stated that "*there was not a sufficient basis to conclude that there was an impairment indicator*". In addition, Rio Tinto referred to a number of factors which it claims could have mitigated to a certain extent the impact of a decline in the assessed fair value of the RTCM Assets arising as a result of the development of an alternative transport option. However:

(a) IAS 36 does not refer to the existence of uncertainty being a permissible reason for delaying or avoiding an impairment test and, likewise, the relevant provisions of IAS 28 do not refer to uncertainty. In my opinion, an impairment test should be undertaken even if, as a result of uncertainty, it is only possible to undertake the test using a number of best estimates as inputs or on a risk-weighted basis to reflect the level of uncertainty; and

(b) the existence of mitigating factors could ultimately mean that an entity is not required to recognise an impairment, despite the existence of indicators of impairment. However, in order for the entity to conclude in this regard it is necessary for the entity to undertake the impairment test. The purpose of an impairment test is not only to quantify the amount of an impairment that is known to exist, it is also to determine whether an impairment may exist.

10 The relevant information provided to PwC in relation to the 2012 Interim Financial Statements

10.1 Introduction

10.1.1 In this Section, I consider the scope of PwC's work in relation to Rio Tinto's 2012 Interim Financial Statements and the relevant requirements relating to the provision of information to an entity's auditor for the purposes of a review of interim financial statements. For the purposes of this consideration, I have provided certain comparisons with the scope of PwC's work in relation to Rio Tinto's 2011 Annual Financial Statements and the related requirements relating to the provision of information to an auditor.

10.1.2 I then provide an overview of the relevant information that I would expect to be provided to an auditor for the purposes of an interim review involving the consideration of the carrying amount of material assets and consider this in the context of PwC's work in relation to the carrying amount of RTCM as at 30 June 2012.

10.2 The scope of PwC's work

10.2.1 The Independent auditors' report of PwC included in Rio Tinto's 2011 Annual Financial Statements stated that PwC were responsible for auditing and expressing an opinion on the financial statements "*in accordance with applicable law and International Standards on Auditing (UK and Ireland) and Australian Auditing Standards*"[306].

10.2.2 PwC did not however audit Rio Tinto's 2012 Interim Financial Statements but did undertake a review of them under International Standard on Review Engagements ("**ISRE**") 2410 "*Review of interim financial information performed by the independent auditor of the entity*".

10.2.3 In accordance with ISRE 2410, the objective of an engagement to review interim financial information is "*to enable the auditor to express a conclusion whether, on the basis of the review, anything has come to the auditor's attention that causes the auditor to believe that the*

[306] Rio Tinto's 2011 Annual Financial Statements, Independent auditors' report, page 216

interim financial information is not prepared, in all material respects, in accordance with an applicable financial reporting framework"[307].

10.2.4 A review under ISRE 2410 therefore provides negative assurance in relation to interim financial information, which is a lower level of assurance than that provided by an auditor in relation to annual financial statements. This is consistent with the comments that Mr Hughes made in his deposition[308].

10.2.5 With regard to the difference between an audit and a review of interim financial information, ISRE 2410 confirms:

"*A review consists of making inquiries, primarily of persons responsible for financial and accounting matters, and applying analytical and other review procedures. A review may bring significant matters affecting the interim financial information to the auditor's attention, but it does not provide all of the evidence that would be required in an audit*"[309].

10.2.6 Where half-yearly financial statements have been audited or reviewed, there is a requirement under the DTR for the audit / review report to be reproduced in the financial statements[310]. In this regard, Rio Tinto's 2012 Interim Financial Statements include an Independent Review Report from PwC which confirmed the scope of PwC's review as follows:

"*We conducted our review in accordance with International Standard on Review Engagements (UK and Ireland) 2410* […] ***A review is substantially less in scope than an audit*** *conducted in accordance with International Standards on Auditing (UK and Ireland) or Australian Auditing Standards and consequently* ***does not enable us to obtain assurance that we would become aware of all significant matters that might be identified in an audit.*** *Accordingly, we do not express an audit opinion*" [emphasis added][311].

[307] ISRE 2410, paragraph 7
[308] Mr Hughes deposition transcript, dated 21 May 2019, page 18
[309] ISRE 2410, paragraph 9
[310] FSA Handbook (as at 30 June 2012), Disclosure and Transparency Rules, article 4.2.9
[311] Rio Tinto's 2012 Interim Financial Statements, Independent Review Report of PwC, page 43

10.3 The provision of information to auditors

10.3.1 The Companies Act provides that auditors have a right to access a company's books, accounts and records and may require specified individuals at the company to provide them with such information or explanations as they think are necessary for the performance of their duties as auditors[312].

10.3.2 Separately, the Companies Act requires the directors of a company to prepare a directors' report for each financial year which is to include a statement in relation to the disclosure of information to the company's auditors. This statement must specifically confirm that[313]:

(a) "*so far as the director is aware, there is no relevant audit information of which the company's auditor is unaware*"; and

(b) "*he has taken all the steps that he ought to have taken as a director in order to make himself aware of any relevant audit information and to establish that the company's auditor is aware of that information*".

10.3.3 "*Relevant audit information*" is defined in the Companies Act as "*information needed by the company's auditor in connection with preparing his report*"[314]. This includes any information that auditors need in order to audit and express an opinion on a set of financial statements.

10.3.4 Rio Tinto's 2011 Annual Financial Statements included the required declaration from the directors (as set out at paragraph 10.3.2 above) in relation to the disclosure of information to Rio Tinto's auditors[315]. This was signed by Jan Du Plessis, Chairman, Rio Tinto Group ("**Mr Du Plessis**"), Mr Albanese and Mr Elliott.

10.3.5 The above Companies Act requirements in respect of the provision of information to auditors and the related statement from the directors of a company relate only to audited annual financial statements. Rio Tinto's 2012 Interim Financial Statements do not therefore include an equivalent declaration from the directors in relation to the disclosure of information to PwC for the purposes of the interim review work.

[312] Companies Act, Section 499
[313] Companies Act, Section 418(2)
[314] Companies Act, Section 418(3)
[315] Rio Tinto's 2011 Annual Financial Statements, Directors' declaration, page 215

10.3.6 Rio Tinto did however provide a letter of representation dated 8 August 2012 to PwC in connection with their review of the 2012 Interim Financial Statements[316]. The representations from the Board of Directors of Rio Tinto set out in this letter included:

(a) "*the interim financial information* […] *has been prepared and presented in accordance with*" IAS 34, the DTR and the Corporations Act;

(b) "*we have made available to you* [PwC] *all books of account and supporting documentation, and all minutes of meetings of shareholders and the board of directors*"; and

(c) "*Except as disclosed in the interim financial information, we have no plans or intentions that may materially affect the carrying value or classification of assets and liabilities reflected in the interim financial information*".

10.4 Key relevant information for an interim review

10.4.1 In my experience, I would expect interim review work undertaken by an auditor to focus on, *inter alia*, the significant accounting matters which may affect the interim financial statements. Of relevance to this report, this work would include a consideration of whether there are indicators of impairment and any resulting impairments in relation to the carrying amount of material assets as at the interim reporting date. Examples of the information that I consider would be relevant to this consideration include the following:

(a) minutes of meetings of the Board of Directors and the Audit Committee;

(b) an explanation from the management of the entity of any significant developments that have taken place in relation to the assets in question or changes to key assumptions in respect of those assets;

(c) details of any forecasts, DCF calculations or valuations prepared by the entity in relation to the assets in question;

(d) details of the assessments prepared by the management of the entity in relation to whether there were indicators of impairment; and

[316] SEC Exhibit 531

(e) details of any impairment tests that have been undertaken.

10.4.2 In my experience, the working papers of an auditor undertaking an interim review in accordance with ISRE 2410 will be less detailed than those for an annual audit. As confirmed by ISRE 2410, the auditor's work will primarily involve making inquiries and applying analytical and other review procedures and will not therefore necessarily involve obtaining detailed supporting information and evidence from the entity. In this context, the auditor is more reliant on the management of the entity to provide the relevant information and updates than for an annual audit.

10.4.3 In accordance with ISRE 2410, an auditor undertaking an interim review should prepare documentation that is sufficient and appropriate to provide a basis for the conclusion of the review[317]. If the example key information set out at paragraph 10.4.1 above had been provided to the auditor as part of its review, in my experience, it would be reflected in their working papers.

10.4.4 Within the available evidence, I have identified certain documents and deposition transcripts relating to work undertaken by PwC during the Material Reporting Period, including PwC's consideration of the carrying amount of the RTCM Assets included in Rio Tinto's 2012 Interim Financial Statements. I have referred to these documents below in order to set out the key information that I have assumed was communicated to (and considered by) PwC, however, I am not opining on whether the assertions in these documents and transcripts are true or whether they reflect all of the information that was provided to PwC.

10.4.5 Based on my review of the available evidence, I have identified limited references to information relating to RTCM that was provided to PwC in connection with their review of Rio Tinto's 2012 Interim Financial Statements. I would however expect this to be less detailed than the information that is provided to an auditor for the purposes of an annual audit, with more emphasis during the interim review on making inquiries with the relevant

[317] ISRE 2410, paragraph 64

individuals at the entity. This is consistent with certain statements made by individuals from PwC in transcripts from depositions[318, 319].

10.4.6 In the June 2012 Paper on Accounting Issues prepared by Dan Larsen, Group Financial Controller, Rio Tinto Group ("**Mr Larsen**") and PwC, PwC provided comments on the conclusions reached in respect of RTCM[320]. In respect of the consideration of indicators of impairment, PwC stated in the paper:

"*For RTCM, whilst we consider that the uncertainty over future transportation might represent an impairment trigger at the half year, we accept management's assessment that discussions are not sufficiently progressed to be able to assess the impact, if any, that this may have on the future development of RTCM. We will continue to monitor the status of discussions as our work at the half year progresses, as well as the impact for the full year*"[321].

10.4.7 Subsequently, in the HY 2012 Impairment Review Paper (which PwC were copied into), Rio Tinto stated "*An assessment of impairment indicators for RTCM in line with RT policy has been prepared*"[322]. In the paper, Rio Tinto set out a number of impairment indicators and the related "*RTCM Assessment*" for each. In respect of the indicators "*Significant changes to the extent or manner of use of the asset that are likely to have an adverse effect on its recoverable value* […]" and "*Indications that the economic performance of an asset is, or will be, significant worse than expected*", the RTCM Assessment stated, *inter alia*[323]:

"*The acquisition was predicated on using barging to move coal from site to port, but this assumption has experienced setbacks due to environmental and other approvals being withheld. This is likely to result in a reduction in the volume of coal brought to market in the*

[318] Jonathan Lambert, Partner, Assurance, PwC ("**Mr Lambert**") stated: "*This was a half-year review, so the inquiries and observation* […] *that we performed are "Have you run the model," "What have you changed," "What's the output," was as far as the inquiries and observation would have gone. They wouldn't have gone into the detail of testing a model or looking at the detail behind that*" (Mr Lambert deposition transcript, dated 8 May 2019, page 144)

[319] Paul Bendall, PwC's Australian Engagement Partner for Rio Tinto in 2012 ("**Mr Bendall**"), stated that PwC did not review any NPV calculations in relation to RTCM during the half-year review and does not mention whether any such calculations were provided to PwC (Mr Bendall deposition transcript, dated 20 June 2019, page 105)

[320] In his deposition, Mr Hughes stated that the purpose of this paper included "*reporting issues that might impact the upcoming period end at 30 June 2012*" (Mr Hughes deposition transcript, dated 21 May 2019, page 75)

[321] June 2012 Paper on Accounting Issues, page 14 (SEC Exhibit 520 used in the deposition of Mr Hughes on 21 May 2019)

[322] HY 2012 Impairment Review Paper, page 1 [RT_00225317 to RT_00225323]

[323] HY 2012 Impairment Review Paper, page 2 [RT_00225317 to RT_00225323]

short term with any shortfalls being deferred to later years. This development has triggered a strategic review of the long term transportation option that RTCM will adopt. Various options including the development of a Greenfield rail and port facility are currently under review, but the study data is still being developed"; and

"*Although there are likely to be significant changes to the coal chain strategy employed by RTCM, it is not yet possible to conclude whether these will have an adverse impact on the business valuation as the options available have not been quantified with any degree of accuracy yet*".

10.4.8 In the HY 2012 Impairment Review Paper, Rio Tinto also stated:

"*In the interim to a full review at year end, in order to give some indication of the value of RTCM two different analyses have been performed*"[324].

10.4.9 The two analyses that were prepared by Rio Tinto, which Mr Drewe considers in Section 13.6 of Drewe 1, were as follows:

(a) a "*potential*" valuation for RTCM of US$5.1 billion; and

(b) comparable transaction analysis which Rio Tinto stated "*indicates that even after the significant reduction in resource/reserves the allocated value is still well within (or even below) the range of comparable transactions*"[325].

10.4.10 Mr Hughes stated in his deposition that the HY 2012 Impairment Review Paper "*made me comfortable concluding that I did not think, on balance, that there was an impairment trigger at the half year* […] *I do recall -- that somebody was telling me that there was a fair value around, an updated fair value of about 5 billion, and when you are carrying something at 3.5 billion, or somewhere around that, that gives you some comfort*"[326].

10.4.11 With regard to the "*potential*" valuation for RTCM of US$5.1 billion, I have identified an earlier draft of the HY 2012 Impairment Review Paper which included the following list of valuation sensitivities and a placeholder for a chart that would quantify them:

[324] HY 2012 Impairment Review Paper, page 3 [RT_00225317 to RT_00225323]
[325] HY 2012 Impairment Review Paper, page 3 [RT_00225317 to RT_00225323]
[326] Mr Hughes deposition transcript, dated 21 May 2019, pages 88 and 89

"*Sensitivity of the project's value to a range of factors has been quantified, they are:*

- *Changes to prices*
- *Multiple rail/port configuration options (including ownership structures)*
- *Sensitivities to ramp up*
- *Sensitivities to maximum production*"[327].

10.4.12 This list was annotated with a comment from an unnamed individual at Rio Tinto which stated "*I don't feel comfortable running these scenarios. They are all (apart from price) downside sensitivities and will drive the wrong outcomes for this exercise*".

10.4.13 In an email dated 1 July 2012, Mr Morris stated the following in relation to the "*potential*" valuation of US$5.1 billion and the list of sensitivities:

"*I have been looking at the valuation scenarios that I have been asked to supply and feel uncomfortable with a) presenting a revised valuation suggesting RTCM is now worth $5.1bn and b) running a seemingly arbitrary (if viewed by a 3rd party without the context we have) set of sensitivities that will all present downside risk to the valuation*"[328].

10.4.14 The list of valuation sensitivities (and the quantification of each) was not included in the final version of the HY2012 Impairment Review Paper, however, the "*potential*" valuation of US$5.1 billion was.

10.4.15 Subsequently, in a further Paper on Accounting Issues prepared by Mr Larsen and PwC for Rio Tinto's Audit Committee Meeting on 30 July 2012 (the "**July 2012 Paper on Accounting Issues**"), Rio Tinto again stated that there were no indicators of impairment for RTCM at 30 June 2012[329]:

[327] Draft of HY 2012 Impairment Review Paper, page 5 [RT_00095292 to RT_00095298]
[328] Email from Mr Morris to Mr Russell-Smith, Ms Vilar and Mr Witthoft, dated 1 July 2012, subject: "*RE: Riversdale Update*" [RT_00095073 to RT_00095081]
[329] July 2012 Paper on Accounting Issues, page 14 [PwCUK000009126_0001]

"*We acknowledge that there is uncertainty over future transportation; however whilst we are confident of finding a viable infrastructure path the breadth of the options means that a central case view is still under development*".

10.4.16 In respect of Rio Tinto's comments in this paper in relation to indicators of impairment, PwC stated:

"*We concur with management's assessment that no impairment triggers exist at the half year*"[330].

10.4.17 In a PwC working paper in relation to the financial year ended 31 December 2012, PwC commented on their previous consideration of whether there were indicators of impairment at 30 June 2012, as follows:

"*The uncertainty surrounding the transportation network was considered as to whether it represented a potential impairment trigger at half year; we challenged management as part of our review procedures, however they remained confident of finding a viable solution. The breadth of potential options available at the time meant that a base case was still under development. Accordingly it was agreed that it would be premature to perform a formal impairment assessment without a plan on which to base any judgement, and this should be done once the planning cycle had completed in H2*"[331].

10.4.18 Whilst PwC stated that they concurred with Rio Tinto's assessment that there were no indicators of impairment in relation to RTCM as at 30 June 2012, the documents referenced earlier in this Section do not establish that PwC were provided with all the key relevant information for the purposes of their interim review.

10.4.19 In Sections 6 to 8 of this report, I set out my assumptions relating to certain significant events in relation to RTCM which occurred during the Material Reporting Period. In my experience, if those events occurred, I would expect PwC to have been informed of them for the purposes of their interim review work in 2012. Individuals from PwC stated in their depositions that

[330] July 2012 Paper on Accounting Issues, page 14 [PwCUK000009126_0001]
[331] PwC working paper in relation to the year ended 31 December 2012 titled "*Impairment of Goodwill and PPE (RTCM)*" [PwCUK000000244_0001 to PwCUK000000244_0016]

they were not made aware of some of those assumed significant events when undertaking their work in relation to RTCM, for example that:

(a) based on the Key Models, Rio Tinto had assessed the expected economic performance of the RTCM Assets to be worse than previously envisaged in the Acquisition Model and had even computed a negative NPV (RT Share) in May 2012[332];

(b) prior to the decision that barging would not be pursued by Rio Tinto, the estimated capacity of barging had reduced significantly (from 30 Mtpa to 10 Mtpa) and the estimated cost of barging (per tonne) had increased[333]; and

(c) Rio Tinto had estimated that significant capital expenditure (which I have assumed was in the region of US$5 billion and US$10 billion) would be required for the Greenfield Line and had not identified a partner to fund some / all of the project[334].

10.4.20 In the July 2012 Paper on Accounting Issues PwC referred to a "*breadth of options*" in relation to the coal chain infrastructure during their review of the 2012 Interim Financial Statements. It is not clear what information had been provided to PwC in relation to the transportation options, however based on my assumptions in Section 7 of this report, Rio Tinto's infrastructure options were limited by 30 June 2012. For example, Rio Tinto had decided not to pursue barging and had identified that "*we* [Rio Tinto] *don't have a business without the greenfield solution*".

10.5 Conclusion

10.5.1 PwC audited Rio Tinto's 2011 Annual Financial Statements and reviewed (with a more limited scope than an audit) Rio Tinto's 2012 Interim Financial Statements.

10.5.2 In accordance with the Companies Act, relevant audit information includes any information that auditors need in order to audit and express an opinion on a set of financial statements. In Rio Tinto's 2011 Annual Financial Statements, Mr Du Plessis, Mr Albanese and Mr Elliott signed a declaration from the directors that, *inter alia*, there was no relevant audit information of which PwC was not aware. The Companies Act requirements in respect of the provision

[332] Mr Lambert deposition transcript, dated 8 May 2019, page 270; Mr Hughes deposition transcript, dated 21 May 2019, pages 125 and 132
[333] Mr Lambert deposition transcript, dated 8 May 2019, pages 267 and 268
[334] Mr Lambert deposition transcript, dated 8 May 2019, pages 139 and 140

of information to auditors and the related statement from the directors of a company relate only to audited annual financial statements so did not apply to PwC's review of Rio Tinto's 2012 Interim Financial Statements.

10.5.3 In my experience, I would expect interim review work undertaken by an auditor to focus on, *inter alia*, the significant accounting matters which may affect the interim financial statements. Of relevance to this report, this work would include a consideration of whether there are indicators of impairment and any resulting impairments in relation to the carrying amount of material assets as at the interim reporting date.

10.5.4 The working papers of an auditor undertaking an interim review in accordance with ISRE 2410 will be less detailed than those for an annual audit. The auditor's work will primarily involve making inquiries and applying analytical and other review procedures and will not therefore necessarily involve obtaining detailed supporting information and evidence from the entity. In this context, the auditor is more reliant on the management of the entity to provide the relevant information and updates than for an annual audit.

10.5.5 In accordance with ISRE 2410, an auditor undertaking an interim review should prepare documentation that is sufficient and appropriate to provide a basis for the conclusion of the review and provides evidence that it was performed in accordance with ISRE 2410[335]. If the key information relating to the consideration of whether there are indicators of impairment had been provided to an auditor as part of its review, in my experience, it would be reflected in their working papers.

10.5.6 Based on my review of the available evidence, I have identified limited evidence of the information relating to RTCM that was provided to PwC in connection with their review of Rio Tinto's 2012 Interim Financial Statements. Whilst PwC appeared to concur with Rio Tinto's assessment that there were no indicators of impairment in relation to RTCM as at 30 June 2012, the documents referenced earlier in this Section do not establish that PwC were provided with all the key relevant information for the purposes of their interim review. Earlier in this report, I set out my assumptions relating to certain significant events in relation to RTCM which occurred during the Material Reporting Period. In my experience, if those events occurred, I would expect PwC to have been informed of them for the purposes of their

[335] ISRE 2410, paragraph 64

interim review work in 2012. Individuals from PwC stated in their depositions that they were not made aware of some of those assumed significant events when undertaking their work in relation to RTCM.

11 How does IFRS require an impairment test to be undertaken?

11.1 Introduction

11.1.1 In Section 9 I concluded that Rio Tinto should have undertaken an impairment test in relation to the RTCM Assets before it published its 2012 Interim Financial Statements. In this Section I set out what work I would have expected to have been undertaken if this impairment test had been carried out. Specifically I consider:

(a) the relevant requirements of IFRS in respect of performing an impairment test, including:

(i) what is meant by the term "recoverable amount" (**Section 11.2**); and

(ii) how the recoverable amount is assessed by reference to the value in use ("**VIU**") of an asset (**Section 11.3**) or the fair value less costs to sell ("**FVLCS**") of an asset (**Section 11.4**);

(b) how the recoverable amount of the RTCM Assets should have been assessed (**Section 11.5**);

(c) the level of materiality for Rio Tinto's 2012 Interim Financial Statements (S**ection 11.6**); and

(d) the relevant requirements of IFRS in relation to the extent to which a recognised impairment can subsequently be reversed (**Section 11.7**).

11.2 Relevant requirements of IFRS in respect of an impairment test

11.2.1 The relevant standard for considering how the impairment test should be undertaken in relation to the RTCM Assets is IAS 36. This standard applies irrespective of whether the category of asset being considered is goodwill, E&E Assets or investments in equity accounted units[336].

[336] IFRS 6, paragraph 20; IAS 28, paragraph 33 (**Exhibit H**)

11.2.2 An entity undertakes the impairment test under IAS 36 by comparing the "*recoverable amount*" of the asset with its "*carrying amount*"[337]. In this regard, the carrying amount of an asset is the amount at which the asset is recognised in the financial statements of the entity[338]. If the recoverable amount of the asset is lower than its carrying amount, the asset is impaired[339].

What is the recoverable amount?

11.2.3 IAS 36 defines the recoverable amount of an asset as "*the higher of its fair value less costs to sell and its value in use*"[340]. This is consistent with the stated accounting policy in Rio Tinto's 2011 Annual Financial Statements[341]. Further, IAS 36 explains:

(a) the FVLCS of an asset is "*the amount obtainable from the sale of an asset or cash-generating unit in an arm's length transaction between knowledgeable, willing parties, less the costs of disposal*"[342]; and

(b) the VIU of an asset is "*the present value of the future cash flows expected to be derived from an asset or cash-generating unit*"[343].

11.2.4 Therefore, if either the FVLCS or the VIU of an asset exceeds its carrying amount, no impairment is required.

11.2.5 These requirements of IAS 36 are consistent with the provisions of Rio Tinto's Controller's Manual[344].

11.3 Assessing the VIU of an asset

11.3.1 IAS 36 explains that the following steps are involved in an assessment of the VIU of an asset:

[337] IAS 36, paragraphs 8 and 9 (**Exhibit C**)
[338] IAS 36, paragraph 6 (**Exhibit C**)
[339] IAS 36, paragraph 8 (**Exhibit C**)
[340] IAS 36, paragraph 6 (**Exhibit C**)
[341] Rio Tinto's 2011 Annual Financial Statements, note 1(i), page 143
[342] IAS 36, paragraph 6 (**Exhibit C**)
[343] IAS 36, paragraph 6 (**Exhibit C**)
[344] Controller's Manual (C360 Impairment of non-current assets), paragraphs 4.1 and 4.2

"*(a) estimating the future cash inflows and outflows to be derived from continuing use of the asset and from its ultimate disposal; and*

(b) applying the appropriate discount rate to those future cash flows"[345].

11.3.2 IAS 36 requires an entity to measure the VIU using cash flow projections based on reasonable and supportable assumptions which reflect management's best estimate of future economic conditions over the life of the asset. Further, the cash flow projections should be based on the most recent financial budgets / forecasts and the entity should consider whether those most recent budgets / forecasts reflect reasonable and supportable assumptions and management's best estimate[346].

11.3.3 This is consistent with the Controller's Manual which states that:

"*Value in use is determined from the net present value of future cash flows expected to be generated through the use of the asset in its current condition*"[347].

11.3.4 Importantly, in respect of the assessment of the VIU of an asset, the Controller's Manual states:

"*The start point for the valuation will normally be the NPV submitted as part of the annual planning process, in accordance with Project Evaluation Guidelines*"[348].

11.3.5 Whilst certain cash flows are not susceptible to precise measurement, IFRS requires these cash flows to be included in the VIU assessment at management's best estimate[349]. The existence of uncertainty does not mean that the recoverable amount should not be assessed, uncertainty should instead be factored into the recoverable amount assessment. For example, a discount rate is applied to the future cash flows to reflect, *inter alia*, their uncertainty and, where various potential options exist, the associated cash flows can be included on a risk-weighted basis.

[345] IAS 36, paragraph 31 (**Exhibit C**)
[346] IAS 36, paragraphs 33 and 38 (**Exhibit C**)
[347] Controller's Manual (C360 Impairment of non-current assets), paragraph 5.1
[348] Controller's Manual (C360 Impairment of non-current assets), paragraph 5.1
[349] IAS 36, paragraph 38 (**Exhibit C**)

11.4 Assessing the FVLCS of an asset

11.4.1 IAS 36 establishes a hierarchy for determining an asset's FVLCS as follows:

(a) "*The best evidence of an asset's fair value less costs to sell is a price in a binding sale agreement in an arm's length transaction, adjusted for incremental costs that would be directly attributable to the disposal of the asset*"[350];

(b) "*If there is no binding sale agreement but an asset is traded in an active market, fair value less costs to sell is the asset's market price less the costs of disposal. The appropriate market price is usually the current bid price. When current bid prices are unavailable, the price of the most recent transaction may provide a basis from which to estimate fair value less costs to sell, provided that there has not been a significant change in economic circumstances between the transaction date and the date as at which the estimate is made*"[351]; and

(c) "*If there is no binding sale agreement or active market for an asset, fair value less costs to sell is based on the best information available to reflect the amount that an entity could obtain, at the end of the reporting period, from the disposal of the asset in an arm's length transaction between knowledgeable, willing parties, after deducting the costs of disposal*"[352].

11.4.2 The provisions in Rio Tinto's Controller's Manual and Rio Tinto's stated accounting policy in its 2011 Annual Financial Statements are consistent with the above[353].

11.4.3 With regard to the situation set out at paragraph 11.4.1 (c), the accounting policies in Rio Tinto's 2012 Annual Financial Statements state that:

(a) the FVLCS is "*often estimated using discounted cash flow techniques*" with estimates based on detailed "life of mine" and / or production plans[354]; and

[350] IAS 36, paragraph 25 (**Exhibit C**)
[351] IAS 36, paragraph 26 (**Exhibit C**)
[352] IAS 36, paragraph 27 (**Exhibit C**)
[353] Controller's Manual (C360 Impairment of non-current assets), paragraphs 6.1 to 6.3; Rio Tinto's 2011 Annual Financial Statements, note 1(i), page 143
[354] Rio Tinto's 2012 Annual Financial Statements, page 152

(b) cash flow forecasts used for FVLCS purposes are to be based on "*management's best estimates of expected future revenues and costs*"[355].

11.4.4 The principal difference between a net cash flow analysis undertaken when assessing the VIU of an asset and a net cash flow analysis undertaken when assessing the FVLCS of an asset is that FVLCS requires an entity to use assumptions that a market participant would be likely to adopt, whereas a VIU requires the use of entity-specific assumptions.

11.4.5 For example, in a FVLCS approach, the entity might include future expansionary capital expenditure relating to subsequent phases of mining which would not be permissible under a VIU approach. Further, in a VIU approach the entity would use the entity-specific discount rate whereas in the FVLCS approach it would adopt the discount rate of a market participant.

11.5 Assessing the recoverable amount of the RTCM Assets

11.5.1 Rio Tinto stated that, when it undertook the January 2013 Impairment Test, the recoverable amount of the RTCM CGU (excluding any cash assets) was assessed by reference to FVLCS derived from an analysis of the net present value of expected future cash flows (often referred to as discounted cash flow analysis)[356].

11.5.2 Rio Tinto's use of the FVLCS approach based on discounted cash flow analysis is consistent with my experience of recoverable amount assessments undertaken by other entities and is consistent with Rio Tinto's stated accounting policy in its 2011 Annual Financial Statements (as set out at Section 11.4 above) and 2012 Annual Financial Statements. The FVLCS approach is typically used instead of VIU as FVLCS often provides a higher value. Further, in my experience discounted cash flow analysis is commonly used for recoverable amount assessments in the absence of a binding sale agreement or active market for the RTCM Assets. The exclusion of cash assets from the FVLCS assessment is consistent with the requirements of IFRS. Cash assets do not fall under the scope of IAS 36 and are instead tested for impairment separately under IAS 39.

11.5.3 On this basis, I consider it reasonable to assume that, had Rio Tinto undertaken an impairment test prior to the issuance of its 2012 Interim Financial Statements, the recoverable amount

[355] Rio Tinto's 2012 Annual Financial Statements, page 152
[356] Rio Tinto's 2012 Annual Financial Statements, note 12, page 172

(excluding cash assets) would have been assessed using the FVLCS approach with the value derived from discounted cash flow analysis.

11.5.4 It is not unusual for entities to be faced with the existence of uncertainty when undertaking an impairment test. However, as I explain in Section 9.5 above, an impairment test should still be undertaken when it is required even if, as a result of uncertainty, it is only possible to undertake the test using a number of best estimates as inputs or on a risk-weighted basis to reflect the level of uncertainty. In my experience, it is possible for entities to undertake an impairment test using such approaches.

11.5.5 Had Rio Tinto undertaken the impairment test, such approaches could have been adopted by reference to Rio Tinto's contemporaneous discounted cash flow analysis and its knowledge of the significant post-acquisition events that had taken place.

11.6 Assessing materiality

11.6.1 The definition of "materiality" is provided in Section 9.5 above. International Standard on Auditing[357] 320 "*Materiality in Planning and Performing an Audit*" ("**ISA 320**") then confirms that:

"*The auditor's determination of materiality is a matter of professional judgment*"[358].

"*The concept of materiality is applied by the auditor both in planning and performing the audit, and in evaluating the effect of identified misstatements on the audit and of uncorrected misstatements, if any, on the financial statements and in forming the opinion in the auditor's report*"[359].

11.6.2 In a document produced by PwC titled "*2012 Group Audit Plan*" dated June 2012 (the "**PwC Audit Plan**"), PwC set out its assessment of materiality for Rio Tinto's 2011 Annual Financial Statements and Rio Tinto's 2012 Annual Financial Statements. These assessments are summarised in Table 11A below. The threshold relevant for considering a material impairment in Rio Tinto's financial statements is "Group overall materiality".

[357] International Standards on Auditing (UK and Ireland) are the promulgations of the Auditing Practices Board (previously the Auditing Practices Committee)
[358] ISA 320, paragraph 4
[359] ISA 320, paragraph 5

Table 11A: The assessed level of materiality for Rio Tinto's 2011 Annual Financial Statements and Rio Tinto's 2012 Annual Financial Statements

Materiality threshold	Amount US$ million	Purpose
Group overall materiality	500	"*Identifying and assessing risks of material misstatement*".
Group performance materiality	375	"[…] *used in order to reduce to an appropriately low level the risk that the aggregate of uncorrected and undetected misstatements in the financial statements exceed overall materiality for the financial statements as a whole*".
Group de minimis threshold	25	"[…] *amount below which audit adjustments need not be accumulated and reported to the Audit Committee* […]".

11.6.3 It is evident from Table 11A above that group materiality in Rio Tinto's 2011 Annual Financial Statements was assessed to be US$500 million. With regard to Rio Tinto's 2012 Interim Financial Statements, Group materiality was stated to be US$250 million "*based on half of the full year materiality*"[360].

11.6.4 Therefore, in PwC's judgement a misstatement in Rio Tinto's 2012 Interim Financial Statements of US$250 million or more would have been deemed material.

11.6.5 I have also undertaken my own assessment of materiality under Mazars' audit methodology based upon the available financial information. In my opinion, PwC's judgements relating to materiality appear reasonable.

11.6.6 The total carrying amount of the RTCM CGU in Rio Tinto's 2012 Interim Financial Statements was US$3,487 million[361]. Therefore, using a US$250 million materiality amount, a material impairment would have been required to have been recognised if the recoverable amount of the RTCM CGU was assessed to be less than US$3,237 million[362].

11.6.7 In Rio Tinto's Wells Submission, Rio Tinto states that any "*alleged misstatement*"[363] relating to the RTCM Assets was immaterial, given:

[360] PwC Audit Plan, Section 2.7.2 (Defendants' Exhibit 126)
[361] See Table 4E
[362] US$3,487 million – US$250 million
[363] Rio Tinto's Wells Submission, page 38

(a) "*accounting misstatements that affect a company's consolidated financial statements* […] *by 5% or less are presumptively immaterial*". Given the carrying amount of the RTCM Assets "*constituted less than 3% of Rio Tinto's total assets*"[364], Rio Tinto considers RTCM to be immaterial.

I agree that an auditor would consider a number of measures when determining the materiality for a particular entity[365], and this may include considering a percentage of total assets as well as, for example, a percentage of net assets, profit before tax or total revenue. Rio Tinto's suggestion that materiality should be calculated as 5% of Rio Tinto's total assets would result in a materiality of more than US$6 billion[366]. In my experience, a materiality benchmark based upon total assets is not anywhere near a 5% level. The reported profit after tax for the six months ended 30 June 2012 was also US$6 billion[367]. This, in my view, confirms that materiality would be significantly less than this amount as profit before tax is a main financial benchmark for users of the financial statements. Further and importantly, PwC provided contemporaneously its assessment of materiality to Rio Tinto (by way of the PwC Audit Plan) which PwC stated was based on profit before tax as follows: "*Overall materiality of $500 million profit before tax has been set after considering the Group's forecast results for 2012*"[368]. I have not seen any evidence which suggests that Rio Tinto did not accept PwC's judgement;

(b) the "*alleged misstatement*" arose from a valuation which was "*not susceptible to "precise measurement"*", as the CGU in respect of the RTCM Assets (the "**RTCM CGU**") was "*a predominantly exploratory asset*"[369]. However, IAS 8 provides for the use of estimates and judgements, explaining that "*Estimation involves judgements based on the latest available, reliable information*"[370] and "*The use of reasonable estimates is an essential part of the preparation of financial statements and does not*

[364] Rio Tinto's Wells Submission, page 38
[365] ISA 320, paragraph A3 states "*Determining materiality involves the exercise of professional judgment. A percentage is often applied to a chosen benchmark as a starting point in determining materiality for the financial statements as a whole*"
[366] Rio Tinto's total assets as at 30 June 2012 were US$121,243 million (Rio Tinto's 2012 Interim Financial Statements, Group statement of financial position)
[367] Rio Tinto's 2012 Interim Financial Statements, Group income statement
[368] PwC Audit Plan, Section 2.3.1 (Defendants' Exhibit 126). The PwC Audit Plan does not appear to include details of the forecast results for 2012 or the materiality as a percentage of those results
[369] Rio Tinto's Wells Submission, pages 38 and 39
[370] IAS 8, paragraph 32

undermine their reliability"[371]. Importantly, many assets and liabilities are not susceptible to precise measurement and IFRS requires these assets and liabilities to be recognised at management's best estimate and disclose management judgements and sources of estimation uncertainty. The existence of measurement uncertainty does not mean that such items cannot be materially misstated; and

(c) the absence of a "*(negative) market reaction immediately following the announcement of the RTCM impairment*"[372]. The analysis of the reaction of the market following the announcement of the RTCM impairment is not within the scope of my instructions. Notwithstanding this, I note that:

(i) in order to analyse the market reaction, it would be necessary to also consider the extent to which the market was aware of any potential impairment prior to the announcement; and

(ii) a market reaction can only be assessed with hindsight and analysing or considering a subsequent market reaction is not how an auditor determines materiality.

11.7 Relevant requirements of IFRS in respect of reversing a recognised impairment

11.7.1 The relevant requirements of IFRS in respect of reversing a previously recognised impairment are dependent upon the particular asset in question.

11.7.2 With regard to goodwill, IAS 36 confirms that, once an impairment of goodwill has been recognised in a set of annual financial statements, it cannot be reversed in a subsequent period[373]. IFRIC 10 "*Interim Financial Reporting and Impairment*" contains an equivalent confirmation in relation to impairments previously recognised in interim financial statements[374].

11.7.3 With regard to other assets (including E&E Assets and investments in equity accounted units) or CGUs, IAS 36 confirms that an entity should assess at the end of each reporting period

[371] IAS 8, paragraph 33
[372] Rio Tinto's Wells Submission, page 39
[373] IAS 36, paragraph 124 (**Exhibit C**)
[374] IFRIC 10 "*Interim Financial Reporting and Impairment*", paragraph 8. IFRIC Interpretations are developed by the IFRS Interpretations Committee and are approved by the IASB

whether there is any indication that a previously recognised impairment loss has decreased or no longer exists[375]. If the result of that assessment is that the carrying amount of the asset / CGU should be increased, the previously recognised impairment loss should (at least in part) be reversed. However, the extent to which the impairment loss can be reversed is restricted such that the increased carrying amount of the asset / CGU is the lower of:

(a) the re-assessed recoverable amount; and

(b) the carrying amount that would have been determined had impairment losses not previously been recognised[376].

****

Steve Brice

Steven Brice

20 December 2019

[375] IAS 36, paragraph 110 (**Exhibit C**)
[376] IAS 36, paragraph 117 (**Exhibit C**)

EXHIBIT 2

Securities and Exchange Commission

Plaintiff

v.

Rio Tinto plc, Rio Tinto Limited, Thomas Albanese, and Guy Robert Elliott

Defendants

Expert Report of Christopher Drewe FCA

20 December 2019

MAZARS

DEPOSITION EXHIBIT
SEC 931

Contents

Appendices

1 Introduction

1.1 This report

1.1.1 I am Christopher Drewe, a Partner in Mazars LLP ("**Mazars**"), the UK firm of the Mazars Group. The Mazars Group is an international organisation specialising in audit, advisory, accounting and tax services, with a direct presence in 89 countries and territories drawing on the expertise of 40,000 professionals. In the UK, Mazars has approximately 140 Partners and more than 1,750 staff.

1.1.2 I have been instructed by the Securities and Exchange Commission (the "**SEC**") to prepare this report in connection with the SEC's Complaint, dated 17 October 2017[1] (the "**Complaint**") against Rio Tinto plc, Rio Tinto Limited (collectively "**Rio Tinto**" or "**Rio Tinto Group**"), Thomas Albanese ("**Mr Albanese**") and Guy Robert Elliott ("**Mr Elliott**"). The Complaint relates to the carrying value of a number of assets related to Rio Tinto Coal Mozambique ("**RTCM**") (the "**RTCM Assets**") in Rio Tinto's interim financial statements for the six-month financial period ended 30 June 2012 ("**Rio Tinto's 2012 Interim Financial Statements**").

1.1.3 My instructions relate to the value of RTCM as at 30 June 2012 (the "**Relevant Period End**"). I set out my specific instructions in Section 1.3 below.

1.2 My experience

1.2.1 I am a Chartered Accountant and a Fellow of the Institute of Chartered Accountants in England and Wales (the "**ICAEW**"). I am also a member of the Valuation and the Forensic & Expert Witness Communities of the ICAEW and I have been appointed to the panel of the ICAEW President's Appointment Scheme. As part of this panel, I am nominated by the President of the ICAEW and then jointly instructed by parties in dispute to make determinations, often on valuation and / or financial reporting matters.

[1] Pursuant to the Court's Order of 9 December 2019, I reserve the right to supplement or revise this report if the SEC's Motion to Amend is granted.

1.2.2 I am a Partner in the Forensic and Investigation Services ("**FIS**") team of Mazars, based in London. In addition to undertaking disputes and investigations engagements, the FIS team is responsible for undertaking valuation assignments, both contentious and non-contentious.

1.2.3 I am licensed for valuations work at Mazars (all valuation work is required to be undertaken by a Partner with a valuation license). In order to become licensed, I was nominated by the Executive Board member responsible for my service line in the UK, and was independently assessed (for example on my case experience and adherence to the firm's risk management processes). As a licensed valuations practitioner, my work is subject to independent Quality Control Reviews on a regular basis.

1.2.4 Whilst my practise focuses on contentious valuations, I often also act as Independent Reviewer for non-contentious valuations.

1.2.5 Following qualification as a Chartered Accountant, I have specialised as a Forensic Accountant since 2008. My role was initially to support Experts instructed in the context of litigation, arbitration and criminal proceedings. Under the Expert's supervision, I would assist the Expert in the review of documents, the production of financial models and the preparation of Expert reports.

1.2.6 I began to be instructed as an Expert in my own name in 2015. One of my first Expert instructions was in the case of *Cathal Anthony Lyons v Fox Williams LLP* which was heard in the High Court in London in early 2016. In that case, I was instructed as a Single Joint Expert by the parties to prepare 72 discounted cashflow analyses ("**DCF**") showing the impact on value of different assumptions being adopted. In the Judgment, the Court adopted my calculations.

1.2.7 Since that matter, I have prepared numerous Expert reports, often relating to valuation – whether that is valuing a loss, a contract, an asset, or a company (including a shareholding in a company). My experience includes:

(a) valuations of losses suffered by individuals, corporates and States, whether arising from a breach of a contract or from a negligent or otherwise unlawful act;

(b) valuations of contracts, including construction contracts;

(c) financial reporting valuations, including in relation to goodwill and other intangible assets, as well as various types of financial asset; and

(d) valuations of companies (or shareholdings in a company).

1.2.8 Whilst I work across many sectors, in my fourteen years of professional experience, I have undertaken a number of assignments in the energy (including mining) sector.

1.2.9 Further details of my qualifications and experience are set out in my curriculum vitae at **Appendix A**, including a list of publications that I have authored and a listing of the matters in which I have testified as an expert at trial or by deposition.

1.3 Background to this report and my instructions

1.3.1 On 8 April 2011, Rio Tinto acquired a controlling interest of 52.6% in the shares of Riversdale Mining Limited ("**Riversdale**"). By 1 August 2011, Rio Tinto had increased its interest in Riversdale to 100% and had renamed Riversdale to be Rio Tinto Coal Mozambique. The total consideration for Riversdale was US$4,168 million (excluding cash on acquisition)[2]. I refer to Rio Tinto's acquisition of Riversdale as the "**Transaction**".

1.3.2 At acquisition, the RTCM Assets were principally comprised[3]:

(a) "**Benga**", a joint venture ("**JV**") between Riversdale (65%) and Tata Steel Limited (35%);

(b) "**Zambeze**", a tenement located adjacent to Benga; and

(c) "**Tete East**", a tenement located adjacent to Benga.

1.3.3 On 17 January 2013, Rio Tinto announced that it was going to recognise an impairment of approximately US$3 billion relating to RTCM[4] (the "**January 2013 Impairment**"). This was recognised in Rio Tinto's financial statements for the financial year ended 31 December 2012 ("**Rio Tinto's 2012 Annual Financial Statements**").

[2] Rio Tinto's 2011 Annual Financial Statements, Acquisitions and divestments, page 40
[3] Internal memo, titled "*Rio Tinto Coal Mozambique Impairment Valuation – Update*", dated 11 January 2013 (the "**January Impairment Paper**") [RT_00257820 to RT_00257836]
[4] Rio Tinto's media release, 17 January 2013 "*Rio Tinto impairments and management changes*"; Rio Tinto's 2012 Annual Financial Statements, Financial review, page 36

1.3.4 My instructions are to consider the available evidence and to address the following question:

If Rio Tinto had undertaken an impairment test in relation to RTCM as at the 30 June 2012, would it have led to a material impairment?

1.4 The structure of this report

1.4.1 In order to address my instructions, my report is structured as follows:

(a) in **Section 2**, I provide a summary of my conclusions;

(b) in **Section 3** I start by setting out in overview the impairment to the RTCM Assets announced by Rio Tinto on 17 January 2013 (the "**January 2013 Impairment**");

(c) in **Section 4** I explain in overview some valuation fundamentals and how these fundamentals were applied by Rio Tinto;

(d) in **Section 5** I identify how Rio Tinto was required to conduct the impairment test in relation to RTCM at the Relevant Period End;

(e) in **Section 6** I identify and consider Rio Tinto's contemporaneous[5] assessments of the Net Present Value (or NPV) of the RTCM Assets;

(f) in **Section 7**, by reference to, *inter alia*, the impairment test underpinning Rio Tinto's January 2013 Impairment, I identify the principal factors which led to the decrease in the assessed value of RTCM and / or otherwise impacted its value in the Post Transaction Period;

(g) in **Sections 8 to 12** I then consider each of these principal factors in turn, including how these assumptions developed during the Post Transaction Period; and

(h) finally, in the context of my analysis in Sections 3 to 12, in **Section 13** I then conclude on the question of whether, had Rio Tinto undertaken an impairment test in relation to RTCM as at 30 June 2012, it would have led to a material impairment in Rio Tinto's 2012 Interim Financial Statements. My conclusion is based upon information which I

[5] I refer to the period from Rio Tinto's acquisition of Riversdale to the January 2013 Impairment as the "**Post Transaction Period**"

have assumed was available to management prior to the issuance of Rio Tinto's 2012 Interim Financial Statements.

1.4.2 I have set out a glossary of the key terms and individuals referred to in this report at **Appendix B**.

1.5 The work of Mr Brice

1.5.1 One of my fellow Partners at Mazars, Steven Brice ("**Mr Brice**"), has also been instructed by the SEC in respect of the Complaint. Mr Brice has produced a report dated 20 December 2019 ("**Brice 1**"). In Brice 1, Mr Brice was instructed, based on the available evidence, to:

(a) to review and opine on the accounting standards applicable to Rio Tinto during the relevant period, as they relate to the preparation of interim financial statements and the review of assets for impairment;

(b) consider whether, on the basis of the information available to Rio Tinto during the period between 8 April 2011[6] and 8 August 2012[7] (the "**Material Reporting Period**"), Rio Tinto should have undertaken an impairment test in relation to the RTCM Assets before it published Rio Tinto's 2012 Interim Financial Statements; and

(c) explain what work should have been undertaken if such an impairment test had been carried out.

1.5.2 Mr Brice and I were also instructed by the Financial Conduct Authority in the UK ("**FCA**")[8] in the context of its investigation into Rio Tinto's 2012 Interim Financial Statements. In that investigation, my work focussed on the financial modelling aspects relevant to the FCA's enquiries.

1.6 The available information

1.6.1 The conclusions in my report are based on my experience and on the evidence provided to me. If further evidence becomes available to me, these conclusions may change.

[6] The date that Rio Tinto acquired a controlling interest of 52.6% in Riversdale
[7] The date of approval of Rio Tinto's 2012 Interim Financial Statements
[8] The FCA is the conduct regulator for financial markets and financial services firms in the UK

1.6.2 In my report, where I have cited contemporaneous information and transcripts of witness depositions, I have included these in order to set out my understanding of the facts and circumstances that existed in the relevant period and because, *inter alia*, it enables consideration of the information available to management in the Post Transaction Period. I am not opining on whether the assertions in these documents and transcripts are true. As I explain in Section 4.2, this is consistent with the approach of a valuations Expert in matters such as the current case.

1.6.3 I set out at **Appendix C** a list of the information that I have relied upon in the preparation of this report. For the purposes of both my work and the work of Mr Brice, the SEC provided Mazars with a significant number of documents, including the pleadings, interview and deposition transcripts and the documents provided to the SEC by various parties as part of the disclosure process. In total, we have been provided with approximately 150,000 documents, the significant majority of which are the documents provided as part of the disclosure process.

1.6.4 In light of the significant volume of disclosed documents, Mr Brice and I have used an eDiscovery platform to undertake targeted searches and reviews, aimed at identifying the documents of relevance to our respective instructions. In total, we have reviewed in excess of 15,000 documents. I have shown the sources of all information I have relied upon in the footnotes of this report.

1.6.5 It should be noted that the work I have completed does not constitute an audit and, other than as expressly set out in this report, I have not verified or in any other way checked the information set out in the documents I have reviewed.

1.7 The scope of this report

1.7.1 In completing my work, I have been assisted by individuals within the FIS team, Global Infrastructure Finance team and Accounting Technical Services team at Mazars. I have supervised and reviewed their work and I confirm that the opinions expressed in this report are my own.

1.7.2 Mazars' fees for this engagement are not contingent on the outcome of these proceedings. Mazars is being compensated at a rate of US$665 per hour for my time and between US$230 and US$549 per hour for staff working under my direction.

1.7.3 I have prepared this report solely for the use in these proceedings. It is confidential in all respects other than to be made available to the SEC, Rio Tinto, Mr Albanese, Mr Elliott, their legal advisors and experts and the Court.

1.7.4 This report should not be used, reproduced or circulated for any other purpose without my prior written consent. Mazars accepts no responsibility to third parties in relation to the matters in this report and / or for any breaches of this obligation.

1.7.5 Some figures in this report have been rounded and as a result some computed totals may include rounding differences.

2 Summary of conclusions

2.1.1 Pursuant to International Financial Reporting Standards, the accounting policies disclosed by Rio Tinto in its financial statements, and the requirements set out in Rio Tinto's Controller's Manual, if Rio Tinto had undertaken an impairment test in relation to RTCM as of 30 June 2012, Rio Tinto would have been required to compare:

(a) the carrying value of the relevant assets. The carrying value is the amount at which they were recorded in Rio Tinto's financial statements as of 30 June 2012; with

(b) Rio Tinto's assessment of the fair value less costs to sell (or FVLCS) of the relevant assets[9]. The FVLCS is the amount that could be obtained from selling these assets in an arm's length transaction, between knowledgeable, willing parties, less the costs of disposal.

2.1.2 If the FVLCS had been assessed to be less than carrying value, Rio Tinto would have been required to recognise an impairment in its 2012 Interim Financial Statements.

2.1.3 Rio Tinto's Controller's Manual required the FVLCS assessment to be based upon Rio Tinto's own discounted cashflow models, incorporating assumptions which reflected, *inter alia*, "*the best information available*", management's "*best estimates*", and the "*central estimate cash flow*" (which Rio Tinto had defined as being "*neither… unduly optimistic nor pessimistic, but fully and equally reflect*[ing] *both upside and downside*").

2.1.4 In the Post Transaction Period, Rio Tinto prepared a number of discounted cashflow models which could have been used as the basis for its assessment of the FVLCS of the relevant assets. As the facts and circumstances relating to these assets developed during this period, so did the assets' computed value. Most of these changes should have resulted in significant diminutions in the value of the RTCM Assets, whether considered separately or in aggregate.

[9] Rio Tinto could instead have assessed the value in use (or VIU) of the relevant assets. See Section 5.3. In relation to the RTCM CGU, Rio Tinto concluded that the assessed FVLCS would have been higher than VIU because VIU would only include the current mining operation at Benga

2.1.5 As a result, if Rio Tinto had undertaken an impairment test as at 30 June 2012, it would, in my opinion, have led to a material impairment in Rio Tinto's 2012 Interim Financial Statements.

2.1.6 Further, in my view, the only way for Rio Tinto to have undertaken an impairment test as at 30 June 2012 which did not result in a material impairment would have been if Rio Tinto had assessed the FVLCS without reference to the best information available, by producing cashflows which were not central estimates (because they would necessarily be unduly optimistic) and by adopting assumptions which were not management's best estimates.

3 The January 2013 Impairment

3.1 Introduction

3.1.1 In this Section I set out in overview the January 2013 Impairment of the RTCM Assets. Specifically:

(a) in order to provide context for the January 2013 Impairment, I first identify Rio Tinto's US$3.7 billion valuation of Riversdale as presented to the Rio Tinto Board in December 2010 (**Section 3.2**). It was on the basis of this valuation that the Board approved bids for Riversdale of AUS$17.0 per share; and

(b) then, I summarise the January 2013 Impairment (**Section 3.3**). Following the impairment to the RTCM Assets of US$2,860 million, the RTCM Assets had a carrying value in Rio Tinto's financial statements of US$611 million.

3.2 The acquisition of Riversdale

3.2.1 In a paper authored by Doug Ritchie, Chief Executive, RTE[10] ("**Mr Ritchie**"), titled "*The Acquisition of Riversdale Mining Limited*", prepared for the Board Meeting dated 16 December 2010 (the "**December 2010 Riversdale Board Paper**")[11], it was explained that:

"*The due diligence process has resulted in a valuation of US $3.7 billion or A $ 15.2 per share… The Riversdale projects and tenements are at an early stage of development, therefore a number of opportunities have also been identified which provide upside value potential*"[12].

3.2.2 The "*Base case valuation summary*" of US$3.7 billion (or AUS$15.2 per share) provided in the December 2010 Riversdale Board Paper can be summarised by mine/project as follows:

[10] RTE being Rio Tinto Energy, which was the Rio Tinto product group to which RTCM belonged
[11] December 2010 Riversdale Board Paper [RT_00465374 to RT_00465380]
[12] December 2010 Riversdale Board Paper, page 4 [RT_00465374 to RT_00465380]

Table 3A: "*The Base case valuation summary*" set out in the December 2010 Riversdale Board Paper[13]

	US$'m	*AUS$'m*	*AUS$ / share*
Benga	1,143	1,153	4.7
Zambeze	1,575	1,588	6.5
Tete East	344	347	1.4
Other (excluding cash)	78	78	0.3
Value excluding net debt / cash	***3,140***	***3,166***	***12.9***
Net debt /cash	545	549	2.2
Total value	**3,685**	**3,715**	**15.2**

3.2.3 Therefore, the proposition provided to the Rio Tinto Board was principally for the Benga (US$1,143 million) and Zambeze (US$1,575 million) tenements, with US$344 million of value also attributed to Tete East. As explained in a paper to the Rio Tinto Investment Committee in November 2010, this Base Case valuation assumed that whilst a small amount of coal would initially be transported to the coast for export via the Sena Railway, the expansion beyond Benga Phase 1 would be "*achieved through investment in the barging option, which is the lower cost long term solution*"[14].

3.2.4 The December 2010 Riversdale Board Paper had presented a number of opportunities for "*upside value potential*"[15]. In a paper to the Rio Tinto Investment Committee in November 2010, these were listed to comprise:

(a) additional resource upside from Benga, Zambeze and other tenements[16];

(b) coal bed methane: "*Large tonnages of deep coal on Riversdale's Moatize basin and other tenements contain significant coal bed methane. Riversdale is currently working with the mines department to gain title for this and the Benga mining contract implies a first right to apply for this title*"[17];

[13] December 2010 Riversdale Board Paper, page 4 [RT_00465374 to RT_00465380]
[14] Rio Tinto Investment Committee Paper titled "*The Acquisition of Riversdale Mining Limited*", dated 18 November 2010, page 3 [RT_00283952 to RT_00283977]
[15] December 2010 Riversdale Board Paper, page 4 [RT_00465374 to RT_00465380]
[16] Rio Tinto Investment Committee Paper titled "*The Acquisition of Riversdale Mining Limited*", dated 18 November 2010, page 5 [RT_00283952 to RT_00283977]
[17] Rio Tinto Investment Committee Paper titled "*The Acquisition of Riversdale Mining Limited*", dated 18 November 2010, page 5 [RT_00283952 to RT_00283977]

(c) the "**Benga Power Plant**": "*The project is in a relatively early stage of study with some preliminary approvals obtained and negotiations commenced for both off take and construction*"[18]; and

(d) potential upside from the coal chain: "*the currently modelled rail rate to Beira is approximately double the true cost. This suggests scope to negotiate lower rail tariffs over time with increasing volumes and leverage of having a barging option available*"[19].

3.2.5 At the Rio Tinto Board Meeting on 16 December 2010, the Board authorized bids for Riversdale to AUS$17.0 per share[20]. Ultimately, Riversdale was acquired for US$4.2 billion (AUS$16.5 per share)[21].

3.3 The January 2013 Impairment

3.3.1 In January 2013, Rio Tinto announced that a US$2,860 million impairment charge would be recognised in relation to RTCM. This US$2,860 million impairment charge was the difference between:

(a) the carrying value of the RTCM Assets at 31 December 2012 (excluding cash) of US$3,471 million[22]; and

(b) the assessed value of RTCM at 31 December 2012 of US$611 million.

3.3.2 The assessed value of RTCM at 31 December 2012 of US$611 million can be summarised by mine/project as follows:

[18] Rio Tinto Investment Committee Paper titled "*The Acquisition of Riversdale Mining Limited*", dated 18 November 2010, page 6 [RT_00283952 to RT_00283977]
[19] Rio Tinto Investment Committee Paper titled "*The Acquisition of Riversdale Mining Limited*", dated 18 November 2010, page 5 [RT_00283952 to RT_00283977]
[20] Paper titled "*Project Mercury – Executive Summary*", dated 12 April 2013, page 23 [RT_00001065 to RT_00001091]
[21] Paper titled "*Project Mercury – Executive Summary*", dated 12 April 2013, page 1 [RT_00001065 to RT_00001091]
[22] Untitled PwC working paper [PwCUK000003628_0001]

Table 3B: The assessed value of RTCM at 31 December 2012[23]

	US$'m
Benga	377
Zambeze	448
Tete East	-
Infrastructure enablers (Sena Railway)	(431)
Tax adjustments	90
Potential upsides and downsides[24]	126
Value	**611**

3.3.3 Therefore, the assessed value underpinning the January 2013 Impairment was principally Benga (US$377 million) and Zambeze (US$488 million). Following Rio Tinto abandoning the Barging option (due to its non-feasibility and its rejection by the Government Mozambique), almost all of the coal was expected to be transported via the Sena Railway.

[23] January Impairment Paper [RT_00257820 to RT_00257836]
[24] I refer to these potential upsides and downsides in paragraph 6.4.28 below

4 Valuation underpinnings

4.1 Introduction

4.1.1 In this Section I explain in overview some valuation fundamentals, specifically:

(a) the main approaches to assessing the value of an asset (**Section 4.3**); and

(b) the valuation of assets using what is known as a "**DCF model**" (**Section 4.4**).

4.1.2 Then, in the context of these valuation fundamentals, I identify and summarise Rio Tinto's contemporaneous valuation guidelines (**Section 4.5**) and I explain how, pursuant to these valuation guidelines, Rio Tinto was required to determine the value of assets, investments and projects (**Section 4.6**).

4.1.3 These valuation underpinnings are important context for my report because, had Rio Tinto undertaken an impairment test in relation to the RTCM Assets at the Relevant Period End, the impairment test would have been required to have been undertaken in accordance with certain of these valuation fundamentals.

4.1.4 First, I comment upon valuations standards that are sometimes referred to by valuation practitioners when producing an independent valuation (**Section 4.2**).

4.2 Valuation standards

4.2.1 As a forensic accountant routinely instructed on valuation matters, I am guided by the pronouncements of recognised bodies that are concerned with valuation matters. Whilst such guidance is typically not mandatory, it can provide an important benchmark for valuation practitioners.

4.2.2 In particular, I consider it sometimes helpful to refer in my Expert reports to International Valuation Standards ("**IVSs**"). The IVSs are promulgated by the International Valuation Standards Council ("**IVSC**"), an independent global standard setter for the valuation profession.

4.2.3 In the context of this guidance, the typical approach of a valuation Expert acting in litigation or arbitration when considering and/or opining on valuation issues after the event will comprise a combination of the following:

(a) providing an explanation of valuation concepts relevant to the particular matter;

(b) reviewing the available contemporaneous evidence to identify the relevant facts and circumstances upon which the valuation was (or should have been) based;

(c) reviewing any relevant witness testimony;

(d) reviewing contemporaneously prepared valuation models; and

(e) flexing[25] the contemporaneously prepared valuation models and / or construction of a new valuation model.

4.2.4 Importantly, the approach set out above is consistent with the approach I have taken in this matter.

4.3 Valuation approaches

What is a valuation?

4.3.1 An assessment of value should be based on an informed consideration of:

(a) the most probable amount that would be paid for an asset. This is therefore a hypothetical price in a hypothetical transaction; or

(b) the economic benefit of owning an asset. This is the benefit that would accrue to the owner of the asset as a result of ownership.

What are the main approaches to valuing an asset?

4.3.2 There are three main approaches to assessing the value of an asset, whether that asset is a company or shares in a company, a tangible or an intangible asset or a project:

[25] Flexing is the process by which assumptions in a calculation are adjusted in order to observe the impact of the changes on the computed output of the calculation

(a) the "**Market Approach**", which provides an indication of value by comparing the asset with identical or comparable assets for which price information is available. This may be based upon data drawn from previous market transactions or from publicly available exchanges;

(b) the "**Cost Approach**", which provides an indication of value using the economic principle that a buyer will pay no more for an asset than the cost to obtain an asset of equal utility whether by purchase or by construction, unless undue time, inconvenience, risk or other factors are involved; and

(c) the "**Income Approach**", which provides an indication of value by converting future cashflows ("**FCF**") to a single value at the valuation date. The most commonly applied method for determining the value of an asset using the income approach is the production of a DCF model.

4.4 Valuing assets using a DCF model

4.4.1 The valuation of an asset by reference to a DCF model is based upon the economic theory that the value of an asset equates to the net present value (that is, at the valuation date) of its expected future cashflows; the net present value of the future cashflows is typically referred to as the "**NPV**". When computing the NPV of an asset, the valuer is required to first identify the FCF generated by the asset – this will include the revenue generated by the asset and the costs incurred by ownership of the asset.

4.4.2 Having identified the FCF of the asset, these future cashflows are required to be discounted back to the date of valuation. This discount is required because of:

(a) the principle of the time value of money – US$1 today is worth than more than US$1 in the future; and

(b) there are risks associated with future cashflows.

Illustrative example of a DCF

4.4.3 The computation of the value of an asset by reference to a DCF model is best illustrated by way of an example. Consider an asset which is expected to generate income of

US$100 million per annum for five years and incur costs of US$175 million in year 1 and US$50 million per annum in years 2 to 5. The FCF can be determined as follows:

Table 4A: Illustrative example of the computation of a FCF

	Year 1	**Year 2**	**Year 3**	**Year 4**	**Year 5**
	US$'m	***US$'m***	***US$'m***	***US$'m***	***US$'m***
Income	100	100	100	100	100
Costs	(175)	(50)	(50)	(50)	(50)
FCF	**(75)**	**50**	**50**	**50**	**50**
Cumulative FCF	**(75)**	**(25)**	**25**	**75**	**125**

4.4.4 In this illustrative example, whilst the asset is expected to generate positive cashflows from year 2 *et seq*, it is not until year 3 that the asset generates a cumulative positive FCF. Across the life of the asset, the total FCF generated is US$125 million.

4.4.5 Having determined the FCF, each cashflow is then required to be discounted to the valuation date. If the relevant discount rate was assessed to be 5%, the FCF would be discounted by application of a "discount factor"[26] as follows:

Table 4B: Illustrative example of the discounting of a FCF

	Year 1	**Year 2**	**Year 3**	**Year 4**	**Year 5**
	US$'m	***US$'m***	***US$'m***	***US$'m***	***US$'m***
FCF	(75)	50	50	50	50
Discount factor	0.952	0.907	0.864	0.823	0.784
Discounted FCF	**(71)**	**45**	**43**	**41**	**39**
NPV	**Sum of discounted FCF = US$97 million**				

4.4.6 Therefore, following discounting, the NPV (and therefore the computed value) is assessed as US$97 million. Discounting has thus reduced the FCF from US$125 million to US$97 million. In the table below, I illustrate the impact on the computed NPV of applying different discount rates to the FCF:

[26] The discount factor is calculated as 1 / (1 + discount rate)^n, where n equates to the number of periods of discounting

Table 4C: Illustrative example of the impact of different discount rates on the computed NPV

Discount rate	**NPV** *US$'m*
1%	119
5%	97
10%	76
15%	59
20%	45
25%	34

4.4.7 It is evident from Table 4C that, the higher the discount rate, the greater the impact of discounting.

4.4.8 The period over which the cashflows are discounted can also have a significant impact upon the computed NPV. For example, consider an asset which is expected to generate a total FCF of US$100 million with an applicable discount rate of 10%. In the table below I summarise the computed NPV if the FCF are assumed to arise over 5, 10, 20 and 50 years:

Table 4D: Illustrative impact of increasing the period over which the cashflows are discounted

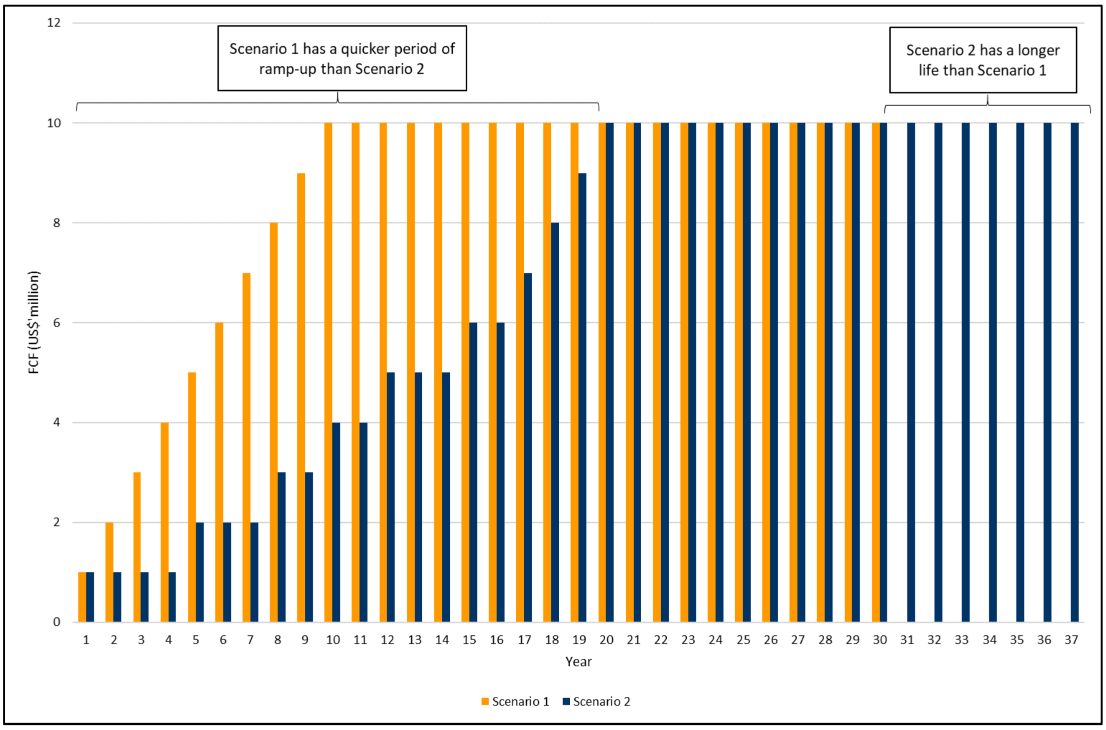
	NPV *US$'m*
5 years (FCF of US$20 million per year)	76
10 years (FCF of US$10 million per year)	61
20 years (FCF of US$5 million per year)	43
50 years (FCF of US$2 million per year)	20

4.4.9 It is evident from Table 4D that, the longer the period over which the discounting takes place, the greater the impact of discounting.

4.4.10 As a result of this important concept, if cash inflows are deferred in a DCF calculation, this will decrease the computed value, irrespective of whether the total FCFs over the life of the project remain unaffected. To illustrate this point, in the graph below I set out two scenarios of a FCF. Both scenarios have a maximum FCF of US$10 million per annum and both generate US$255 million of FCF over the life of the project. However, Scenario 1 has a much

quicker period of ramp-up (the period prior to reaching annual FCF of US$10 million) than Scenario 2. As a result, the life of the project in Scenario 2 is longer.

Figure 4A: Illustrative impact of the deferral of cashflows



4.4.11 Using the discount rate of 10% in both Scenarios results in:

(a) Scenario 1 having a computed NPV of US$62 million; and

(b) Scenario 2 having a computed NPV of US$37 million.

4.4.12 Therefore, the deferral of cashflows in Scenario 2 compared with Scenario 1 results in a significant (40%) decrease in the computed NPV, despite the FCFs over the life of the project being equal.

4.5 Rio Tinto's contemporaneous valuation guidelines

4.5.1 In the context of the valuation fundamentals set out in Sections 4.3 and 4.4 above, in this Section, I identify and summarise the principal valuation guidelines extant at Rio Tinto as at the Relevant Period End. Specifically, I address in turn:

(a) what was referred to by Rio Tinto as its "*Project Evaluation Guidance*" or "**PEG**"[27]; and

(b) other then-extant valuation documents that complement PEG.

The Project Evaluation Guidance or PEG

<u>The purpose of PEG</u>

4.5.2 The purpose of PEG is stated as follows:

"*The purpose of PEG is to define Rio Tinto's project evaluation methodology. It should be used when valuing both new capital projects and existing businesses*"[28].

4.5.3 Therefore, PEG was important guidance for Rio Tinto when it considered its potential acquisition of Riversdale as well as its continuing valuation of the RTCM Assets.

<u>The structure of PEG</u>

4.5.4 PEG is structured into three volumes as follows:

(a) Volume 1: "*Principles and Process*"[29]. Volume 1 includes:

(i) Chapter 1: "*Rio Tinto's Investment Decision Making Process*". This Chapter provides "*an overview of the steps that must be followed when submitting an investment for approval and the decision-making bodies that will need to be engaged*"; and

[27] In my view, PEG is not inconsistent with the IVS
[28] PEG, Volume 1, page 2 [RT_SEC_00115452 to RT_SEC_00115483]
[29] PEG, Volume 1, pages 1 and 2 [RT_SEC_00115452 to RT_SEC_00115483]

(ii) Chapter 2: "*The Principles and Protocols for Project Evaluation*". This Chapter explains "*Rio Tinto's high-level approach that should be adopted when valuing an investment opportunity*";

(b) Volume 2: "*Practitioners' Guide*"[30]. Volume 2 includes:

(i) Chapter 1: "*Developing an Investment Proposal*". This Chapter "*Outlines the content that should be addressed for different types of investment proposals*"; and

(ii) Chapter 2: "*A Practitioners' guide to Project Evaluation*". This Chapter "*Augments the "Principles and Protocols" chapter in volume 1. It is aimed at those who are directly involved in valuation and investment proposal preparation. It includes practical guidance as well as finance theory*"; and

(c) Volume 3: "*Business Modelling Guidance*"[31]. Volume 3 "*Outlines Rio Tinto's financial modelling protocols including model structure and model output*".

4.5.5 Whilst Volume 1 provides "*the over-arching guidance and "rules" that should be understood by all employees involved in preparing, reviewing and making investment decisions*"[32], Volumes 2 and 3 are "*intended as "practitioners' guides" and, as such, provide a more detailed, step-by-step methodology of the investment appraisal process*"[33].

<u>The then-extant versions of PEG</u>

4.5.6 I have identified two versions of PEG: "*PEG 5*" (which is dated August 2009)[34] and "*PEG 6*" (which is dated February 2012)[35]. An internal memo titled "*PEG 2012*", dated 10 January 2012[36], explains that:

"*BED* [the Business Evaluation Department] *has updated the PEG documents, and attached for IC approval is PEG6. PEG6 has restructured PEG 5, the IC Guidance Note and Business*

[30] PEG, Volume 2, pages 1 and 2 [RT_SEC_00115484 to RT_SEC_00115541]
[31] PEG, Volume 3 [RT_SEC_00115417 to RT_SEC_00115451]
[32] PEG, Volume 1, page 2 [RT_SEC_00115452 to RT_SEC_00115483]
[33] PEG, Volume 1, page 2 [RT_SEC_00115452 to RT_SEC_00115483]
[34] PEG 5 [RT_SEC_00070966 to RT_SEC_00071009]
[35] PEG, Volume 1 [RT_SEC_00115452 to RT_SEC_00115483]; PEG, Volume 2 [RT_SEC_00115484 to RT_SEC_00115541]; PEG, Volume 3 [RT_SEC_00115417 to RT_SEC_00115451]
[36] Internal memo, titled "*PEG 2012*", dated 10 January 2012 [RT_SEC_00115544 to RT_SEC_00115671]

Modelling Guidelines to remove duplication and improve accessibility to key information as well as making some changes to content"[37].

4.5.7 The 10 January 2012 internal memo also explained that, whilst "*the rewrite has been comprehensive in terms of structure and format, the content has evolved rather than been transformed*"[38].

4.5.8 Given that the content in PEG 6 has evolved rather than been transformed from PEG 5, in my report references to PEG are to PEG 6, although I note that it was not the extant version throughout part of the Post Transaction Period.

Valuation fundamentals required by PEG

4.5.9 Consistent with the valuation fundamentals that I set out in Sections 4.3 and 4.4, PEG explains that:

"*Rio Tinto's basic measure of shareholder value is net present value (NPV). The NPV calculation determines whether an investment made today is worth more to our shareholders than it costs and by how much. The NPV of an investment is calculated by discounting all future cash flows over the life of the project*"[39].

4.5.10 Importantly, PEG refers to the requirement for everyone involved in valuation to understand the concept of a "*central estimate cash flow*" or the "*Expectation Concept*"[40]. PEG states that:

"*Future cash flows are, obviously, highly uncertain and judgements have to be made on all their components such as ore reserve size and quality, project schedule, ramp up timeline, production rate, future prices, capital costs, operating costs and taxes etc.*

The fundamental concept of a 'central estimate' cash flow [or "**CECF**"] ***is that it should neither be unduly optimistic nor pessimistic, but fully and equally reflect both upside and downside****. The theoretical definition of a CECF is therefore the probability-weighted average*

[37] Internal memo, titled "*PEG 2012*", dated 10 January 2012, page 1 [RT_SEC_00115544 to RT_SEC_00115671]
[38] Internal memo, titled "*PEG 2012*", dated 10 January 2012, page 2 [RT_SEC_00115544 to RT_SEC_00115671]
[39] PEG, Volume 1, page 20, Section 5.3 [RT_SEC_00115452 to RT_SEC_00115483]
[40] PEG, Volume 1, page 21, Section 5.6 [RT_SEC_00115452 to RT_SEC_00115483]

(mean) of all possible outcomes that the cash flow might take, with weighting equal to the probability of each value"[41] [emphasis added].

4.5.11 This definition of a central estimate is also explained by Simon Morris, General Manager – Business Analysis and Operations Support, RTCM ("**Mr Morris**")[42].

4.5.12 As explained in this report, the requirement for a CECF is significant in the context of Rio Tinto's contemporaneous valuations of the RTCM Assets. In Sections 8 to 12 below I identify that a number of other Rio Tinto valuations undertaken in the Post Transaction Period were also not a CECF. In relation to the valuation presented to the Rio Tinto Board in December 2010[43], the Project Mercury review team[44] specifically concluded that "*RTE's valuation did not meet PEG requirements and is not a central case*"[45].

4.5.13 PEG also required "*upside potential*" to be considered by reference to "*sensitivity analysis*", rather than the upside potential being included in the CECF[46]. Sensitivity analysis is used in valuation to identify the impact on the computed NPV of adjusting certain assumptions. For example, in the table below I provide a simple sensitivity analysis of a company which assumes it will earn US$100 million revenue per year for a four-year period, with corresponding costs of US$50 million per year in its CEFC, but considers that there is:

(a) a potential upside of a 10% increase in revenue ("*Sensitivity 1*");

(b) a potential downside of a 5% decrease in revenue ("*Sensitivity 2*"); and

(c) a potential downside of a 20% increase in costs ("*Sensitivity 3*").

[41] PEG, Volume 1, page 21, Section 5.6 [RT_SEC_00115452 to RT_SEC_00115483]
[42] Mr Morris deposition transcript, dated 8 November 2018, page 42
[43] In the December 2010 Riversdale Board Paper
[44] Following the January 2013 Impairment, Rio Tinto Energy ("**RTE**") (being the Rio Tinto product group to which RTCM belonged) sponsored an independent post-acquisition review of the Riversdale transaction, which was undertaken in early 2013. This was referred to contemporaneously by Rio Tinto as "*Project Mercury*"
[45] Paper titled "*Project Mercury – Executive Summary*", dated 12 April 2013, page 4 [RT_00001065 to RT_00001091]
[46] PEG, Volume 1, page 24, Section 6.1 [RT_SEC_00115452 to RT_SEC_00115483]

Table 4E: Illustrative sensitivity analysis

	Year 1 US$'m	Year 2 US$'m	Year 3 US$'m	Year 4 US$'m	Total US$'m
CEFC					
Revenue	100	100	100	100	**400**
Costs	(50)	(50)	(50)	(50)	**(200)**
FCF	***50***	***50***	***50***	***50***	***200***
Discount factor	0.952	0.907	0.864	0.823	
DCF	**48**	**45**	**43**	**41**	**177**
Sensitivity 1: 10% increase in revenue					
Revenue	110	110	110	110	**440**
Costs	(50)	(50)	(50)	(50)	**(200)**
FCF	***60***	***60***	***60***	***60***	***240***
Discount factor	0.952	0.907	0.864	0.823	
DCF	**57**	**54**	**52**	**49**	**213**
Sensitivity 2: 5% decrease in revenue					
Revenue	95	95	95	95	**380**
Costs	(50)	(50)	(50)	(50)	**(200)**
FCF	***45***	***45***	***45***	***45***	***180***
Discount factor	0.952	0.907	0.864	0.823	
DCF	**43**	**41**	**39**	**37**	**160**
Sensitivity 3: 20% increase in costs					
Revenue	100	100	100	100	**400**
Costs	(60)	(60)	(60)	(60)	**(240)**
FCF	***40***	***40***	***40***	***40***	***160***
Discount factor	0.952	0.907	0.864	0.823	
DCF	**38**	**36**	**35**	**33**	**142**

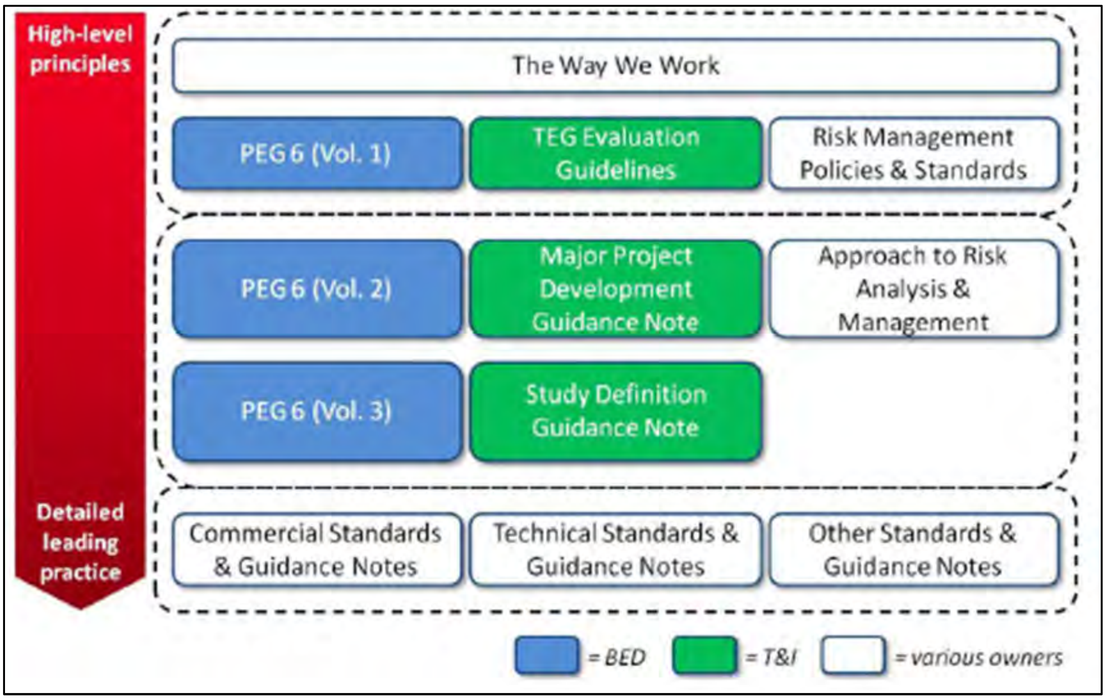
4.5.14 Therefore, in this illustrative analysis, the sensitivity analysis undertaken provides a range of computed NPVs from US$142 million to US$213 million. The computed CECF is within this range (US$177 million).

4.5.15 The requirement of PEG to consider potential upsides by reference to sensitivity analyses (rather than the upside being incorporated into the CECF) is significant in the context of Rio Tinto's valuations of the RTCM Assets in the Post Transaction Period because many of these valuations incorporated potential upsides into the valuation – I discuss this further in Sections 8 to 12 below.

Other then-extant valuation documents that complement PEG

4.5.16 PEG explains that it is "*complemented by a suite of other guidance documents that provide specific instruction primarily on the technical components of project development*"[47]. PEG summarises these documents in the following diagram:

Figure 4B: The other then-extant valuation documents that complement PEG[48]



4.5.17 I address the "*TEG*[[49]] *Evaluation Guidelines*", the "*Major Project Development Guidance Note*" and the "*Study Definition Guidance Note*" in turn:

[47] PEG, Volume 3, page 3 [RT_SEC_00115417 to RT_SEC_00115451]
[48] PEG, Volume 2, page 3 [RT_SEC_00115484 to RT_SEC_00115541]
[49] TEG meaning Technical Evaluation Group

TEG Evaluation Guidelines

4.5.18 I have identified an undated document produced by Technology and Innovation[50] titled "*Evolution of Rio Tinto Projects Evaluation Stages*"[51]. It therefore appears to be the document (or an earlier version of the document) referred to in PEG (see Figure 4B above) as the "*TEG Evaluation Guidelines*".

4.5.19 The TEG Evaluation Guidelines explain that they are "*intended to clarify the processes that Rio Tinto adopts in developing projects*"[52]. Further, they support "*the PEG in describing how Rio Tinto projects evolve from inception to the point where a decision on Implementation is made and outlines the standard terminology for naming project development stages*"[53].

4.5.20 The TEG Evaluation Guidelines provides the following flowchart of project development stages:

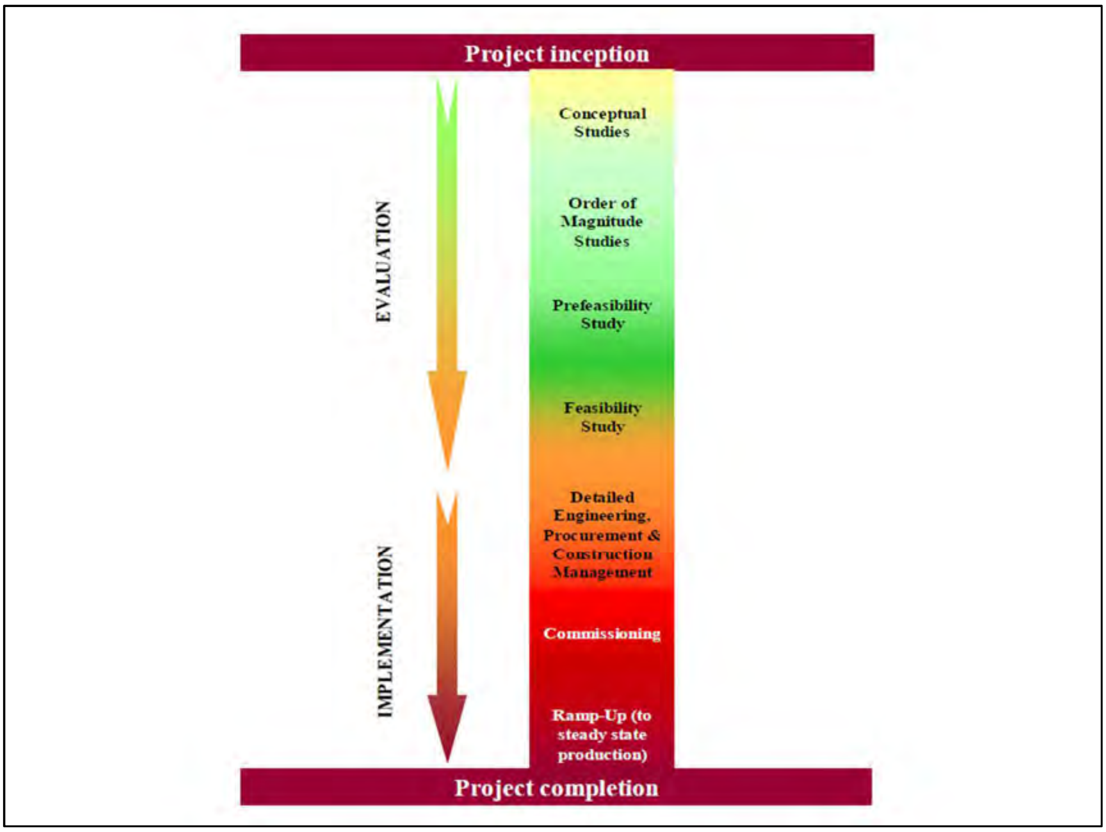
[50] "*Technology & Innovation (T&I) consists of a central team of technology professionals and centres. These develop leading practice and promote improvements in technology, mining, processing, asset management, strategic production planning, and project development, execution and evaluation. Emphasis is given to shared and visible measures of operational effectiveness, the improvement of analytical tools, development of staff capabilities, and implementation of technology step changes that will confer competitive advantage in development of orebodies likely to be available to the Group in the future*." Rio Tinto's 2011 Annual Financial Statements, page 31

[51] TEG Evaluation Guidelines, page 1 [RT_SEC_00127893 to RT_SEC_00127916]

[52] TEG Evaluation Guidelines, page 1 [RT_SEC_00127893 to RT_SEC_00127916]

[53] TEG Evaluation Guidelines, page 1 [RT_SEC_00127893 to RT_SEC_00127916]

Figure 4C: Project development stages per the TEG Evaluation Guidelines[54]



4.5.21 These project development stages are:

(a) "**Conceptual**": the TEG Evaluation Guidelines explain:

"*Conceptual studies are generally used to determine if, and when, an exploration project is sufficiently interesting to warrant a more detailed Order-of-Magnitude technical and economic study*"[55].

"*Of all of the project stages, Conceptual studies involve the greatest **uncertainty** and imply the need to continually revisit and revise assumptions in the light of new data. Accordingly the study may involve a number of iterations as new data are generated and ideas revised*"[56].

[54] TEG Evaluation Guidelines, page 4 [RT_SEC_00127893 to RT_SEC_00127916]
[55] TEG Evaluation Guidelines, page 8 [RT_SEC_00127893 to RT_SEC_00127916]
[56] TEG Evaluation Guidelines, page 9 [RT_SEC_00127893 to RT_SEC_00127916]

"*Conceptual studies are characterised by uncertainty, not least in the likely NPV*"[57];

(b) "**Order-of-Magnitude**": the TEG Evaluation Guidelines explain:

"*The aim of this stage is to determine, for the minimum expenditure, if a business case can be made to justify the cost of the project progressing to Pre-Feasibility*"[58].

"*Order-of-Magnitude Studies may resolve some earlier uncertainties but generally only at a high level, as data remain inadequate for detailed analysis*"[59];

(c) "**Pre-Feasibility**": the TEG Evaluation Guidelines explain:

"*The focus at Pre-Feasibility is to move away from 'second hand' data, such as comparisons with other operations, and to generate the necessary data to examine each potentially viable option in detail*"[60].

"*Pre-Feasibility should result in a much clearer understanding of the size of the prize and the key issues associated with the project*"[61]; and

(d) "**Feasibility**": the TEG Evaluation Guidelines explain:

"*Feasibility has the aim of confirming and maximising the value of a single option for the project with sufficient engineering input to bring capital and operating cost estimates down to a narrow range of uncertainty*"[62].

4.5.22 After Feasibility and the necessary internal approvals, the project will move to "**Implementation**"[63].

[57] TEG Evaluation Guidelines, page 10 [RT_SEC_00127893 to RT_SEC_00127916]
[58] TEG Evaluation Guidelines, page 11 [RT_SEC_00127893 to RT_SEC_00127916]
[59] TEG Evaluation Guidelines, page 13 [RT_SEC_00127893 to RT_SEC_00127916]
[60] TEG Evaluation Guidelines, page 15 [RT_SEC_00127893 to RT_SEC_00127916]
[61] TEG Evaluation Guidelines, page 15 [RT_SEC_00127893 to RT_SEC_00127916]
[62] TEG Evaluation Guidelines, page 19 [RT_SEC_00127893 to RT_SEC_00127916]
[63] TEG Evaluation Guidelines, page 21 [RT_SEC_00127893 to RT_SEC_00127916]

Major Project Development Guidance Note

4.5.23 I have identified a document produced by Technology and Innovation[64] titled "*Major project development guidance note*", dated 17 September 2009[65]. It therefore appears to be the document (or an earlier version of the document) referred to in PEG as the "*Major Project Development Guidance Note*".

4.5.24 The Major Project Development Guidance Note explains that it "*has been prepared to capture and promote the things that need to be done well to continue improving Rio Tinto's capability in developing "major" projects*"[66]. It sets out certain "*broad issues*" including, of relevance to my report[67, 68]:

(a) the importance of realistic estimates: "*Estimates must be realistic.....not influenced to meet a hurdle rate*"[69]. As I explain in Sections 8 to 12 below, when considered in the context of the facts and circumstances that existed in the Post Transaction Period (according to the contemporaneous documents, which I have assumed reflect the information that was available to management), a number of the estimates included in Rio Tinto's valuations undertaken in the Post Transaction Period were not realistic because they contradicted information that appears to have been available to management; and

(b) the requirement to "*Understand and use contingency correctly*": "*Contingency is an allowance made within the project estimate to cover lack of definition in the scope of work, provision for items expected but as yet unidentified, and variations between estimated and actual site conditions, quantities, rates, etc. Thus the more detail that supports the project estimate the lower the level of contingency required*"[70].

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[64] T&I is described at footnote 50
[65] Major Project Development Guidance Note [RT_SEC_00055040 to RT_SEC_00055123]
[66] Major Project Development Guidance Note, page 4 [RT_SEC_00055040 to RT_SEC_00055123]
[67] Major Project Development Guidance Note, page 6 [RT_SEC_00055040 to RT_SEC_00055123]
[68] The Major Project Development Guidance Note also sets out (i) the roles and responsibilities of the project sponsor and project leader, (ii) the Key Rio Tinto roles, (iii) independent reviews and audits should be part of the project development process, (iv) risk management and analysis processes, (v) project evaluation, and (vi) project implementation
[69] Major Project Development Guidance Note, page 7 [RT_SEC_00055040 to RT_SEC_00055123]
[70] Major Project Development Guidance Note, page 7 [RT_SEC_00055040 to RT_SEC_00055123]

Study Definition Guidance Note

4.5.25 I have identified a document titled "*Study definition guidance note*", produced by Technology and Innovation dated 18 March 2010[71]. Its stated objective is to "*improve understanding of the differences between the various study stages and to provide guidance on study contents, milestones and deliverables*"[72]. There is not any specific additional guidance which I consider to be relevant to my report in the Study Definition Guidance Note.

4.6 Rio Tinto's computation of NPV using a DCF analysis

4.6.1 In this Section I explain how, pursuant to PEG, Rio Tinto determined the NPV of assets, investments and projects by reference to a DCF analysis.

4.6.2 PEG requires a DCF analysis to be undertaken by production of a model in Microsoft Excel[73]. Each model will have multiple worksheets[74], each showing[75]:

(a) inputs – the assumptions used in model; and / or

(b) calculations – the calculations of the NPV in the model; and / or

(c) outputs – the computed NPV.

4.6.3 I now address in turn each of the principal inputs into Rio Tinto's models.

Revenue

4.6.4 Revenue is "*the quantity of output produced multiplied by the commodity's price*"[76]. PEG sets out that commodity price, physical assumptions, mine schedule and ramp-up are all considerations in determining revenue.

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[71] Study Definition Guidance Notes [RT_SEC_00248394 to RT_SEC_00248395]
[72] Study Definition Guidance Notes, page 3 [RT_SEC_00248394 to RT_SEC_00248395]
[73] PEG, Volume 3, page 10 [RT_SEC_00115417 to RT_SEC_00115451]
[74] In the alternative, models may be presented in a single work sheet. This does not appear to be the case for models relating to RTCM
[75] PEG, Volume 3, page 10 [RT_SEC_00115417 to RT_SEC_00115451]
[76] PEG, Volume 2, page 28, Section 7.2 [RT_SEC_00115484 to RT_SEC_00115541]

Commodity price

4.6.5 PEG required Rio Tinto to update its key commodity price estimates on a periodic basis in what are described as "*PEG Price and Exchange Rate Assumptions*" tables ("**PEG Updates**")[77]. PEG Updates are issued by Rio Tinto Economics & Markets and set out Rio Tinto's long-term price estimates for commodities, including Hard Coking Coal ("**HCC**") and Thermal Coal. Whilst PEG refers to PEG Updates being updated on a quarterly basis[78], I have also seen contemporaneous documents which suggest that they are required to be updated three times per year[79].

4.6.6 In Section 9.2 below, I analyse the long-term commodity prices included in Rio Tinto's valuations undertaken in the Post Transaction Period. I identify that whilst many of Rio Tinto's DCF models broadly reflect the commodity pricing estimates included in the PEG Updates, there are certain exceptions where valuations were not based upon the latest PEG Updates.

Physical assumptions

4.6.7 Physical assumptions principally refer to the volume and schedule of product to be mined. PEG explains that:

"*The physical assumptions will have a key impact on the whole valuation of the project. Determining the volume of ore to be mined and then designing an operation to maximise the value of the resource requires thorough analysis by specialists*"[80].

Schedule

4.6.8 Saleable production is calculated by reference to what is referred to as the run of mine ("**ROM**"). The ROM is the quantity of ore produced from the mines for processing. Following processing, the remaining product is the "saleable production" and the proportion of saleable production to ROM is referred to as the "yield". Therefore, saleable production can be computed as follows:

[77] PEG, Volume 2, page 28, Section 7.2 [RT_SEC_00115484 to RT_SEC_00115541]
[78] PEG, Volume 2, page 28, Section 7.2 [RT_SEC_00115484 to RT_SEC_00115541]
[79] RTE May 2012 Group Valuation Model, page 7 [RT_00338826 to RT_00338848]
[80] PEG, Volume 2, page 28, Section 7.2.1 [RT_SEC_00115484 to RT_SEC_00115541]

ROM production × yield = saleable production

4.6.9 The ROM production is determined by reference to the entity's estimates of in situ resources. The Joint Ore Reserves Committee ("**JORC**") set a code (the "**JORC Code**") for the classification of mineralised ore bodies. Under the JORC Code[81], in situ mineral occurrences are defined as a resource if they have "*reasonable prospects for eventual economic extraction*"[82]. Resources fall into one of three categories, depending on the confidence in the estimations: inferred resources (low level of confidence), indicated resources (reasonable level of confidence) and measured resources (high level of confidence).

4.6.10 An ore reserve is then defined as the economically mineable part of the measured or indicated mineral resource. Reserves fall into one of two categories: proven and probable. Whilst proven and probable reserves are typically used for assessing NPV, the resources of a company may also represent significant value.

4.6.11 The JORC Code requires that companies review and publish their reserves and resources at least annually[83].

4.6.12 In the context of the above, a mining engineer will determine the ROM production, yield and saleable production over the life of the mine ("**LOM**") and set these estimates out in a mine plan.

4.6.13 PEG requires:

"*For the purposes of PEG, the material to be mined should include waste, ore (mineral reserves) and, if appropriate, additional resources that are likely to be economic but which have not been adequately studied to fully confirm this. This means the volume of ore assumed in the central estimate case may be greater than the reserve as defined by industry reporting standards such as the JORC Code.*

Ore reserves are estimates and contain inherent uncertainties no matter how thoroughly the estimate has been done. ***The central estimate ore tonnes and grade or quality used in the***

[81] The JORC Code is the Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves issued by JORC. The 2004 Edition of the JORC Code was superseded by the 2012 Edition of the JORC Code, which was effective from 20 December 2012 and mandatory from 1 December 2013
[82] Project Ralph Technical Due Diligence, dated 7 January 2011, page 135 [RT_00190059 to RT_00190240]
[83] JORC Code, clause 15, page 9

project evaluation must be prepared and endorsed by an appropriately qualified Competent Person as defined by the JORC Code or equivalent. The volume of ore should not include all the upside or blue sky that can be envisaged, although this potential can be shown as a sensitivity if appropriate"[84] [emphasis added].

4.6.14 Therefore, whilst there may be a difference between the ore reserves reported in Rio Tinto's financial statements and the ore reserves used as a basis in the CECF, the CECF should not include all upside or blue-sky potential.

4.6.15 The reasonableness of the ROM production can be assessed by reference to the ratio between ROM production and the reserves and resources; this might be referred to as a "**Conversion Ratio**". For example, it might be reasonable to conclude that 100% of proven reserves will be converted into ROM production, but only 70% of measured and indicated resources will be. In the DCF Models produced by Rio Tinto that I have analysed, the spreadsheets often include what appear to be Conversion Ratios. For example, in relation to ZAC[85], the following Conversion Ratios are provided:

Figure 4D: The Conversion Ratios relating to ZAC[86]

Resources And Reserves	**JORC - Jun0**	Conversion	Recovered
Reserves - Proven	5.3	100%	5.3
Reserves - Probable	10.1	90%	9.1
Resources - Measured	-	70%	-
Resources - Indicated	-	70%	-
Resources - Inferred	23.6	30%	7.08
Resources - Speculative		30%	-
Total Reserves Opening Balance	39.0	55%	**21.5**

4.6.16 In relation to the above Conversion Ratios, the ratios are being used to determine the ROM, as follows:

[84] PEG, Volume 2, pages 28 to 29, Section 7.2.1 [RT_SEC_00115484 to RT_SEC_00115541]
[85] Zululand coalfields ("**ZAC**") is located in South Africa and was the only operating asset acquired by Rio Tinto in the Transaction. Rio Tinto acquired a 74% interest in ZAC, with the remaining 26% held by the Maweni Mining Consortium (Deloitte PPA Report, page 10 [RT_00180990 to RT_00181048])
[86] Acquisition Model [RT_00337763]

Table 4F: Rio Tinto's determination of the ROM production of ZAC

	JORC	Conversion ratio	Calculation	ROM production (LOM)
	Mt			***Mt***
Reserves - Proven	5.3	100%	5.3Mt x 100%	5.3
Reserves - Probable	10.1	90%	10.1Mt x 90%	9.1
Resources - Measured	-	70%	-	
Resources - Indicated	-	70%	-	
Resources - Inferred	-	30%	-	
Resources - Speculative	23.6	30%	23.6Mt x 30%	7.08
Total ROM production				**21.5**

4.6.17 On the basis that these Conversion Ratios[87] are included in many of the DCF Models that I have seen, I have assumed that these are the Conversion Ratios used by Rio Tinto in the Post Transaction Period to assess the reasonableness of ROM production and / or to determine the ROM production (the "**Apparent Conversion Ratios**"). I note that I have not identified any documents or witness testimony which sets out Rio Tinto's then-extant guidelines on Conversion Ratios.

4.6.18 In Sections 10.2 and 10.3 below, I analyse the production assumptions adopted in Rio Tinto's valuations undertaken in the Post Transaction Period. I identify a number of significant breaches of the requirements of PEG and other concerns in relation to the volumes of production assumed by Rio Tinto. These include:

(a) significant volumes of upside or blue-sky production being included in the CECF (rather than including such potential in a sensitivity analysis); and

(b) volumes of production that are significantly greater than the Apparent Conversion Ratios.

[87] Or adjusted versions of these Conversion Ratios

Ramp-up and steady-state production

4.6.19 The "**steady-state production**"[88] refers to the annual production in the period after the ramp-up of production. "**Ramp-up production**" refers to the annual production in the period prior to the steady-state production.

4.6.20 When modelling the schedule of volume of material to be mined each year, factors which could create delays in the Ramp-up or limitations to the annual steady-state production are required to be considered. These factors include, the delivery time for equipment with long lead times and negotiations with local communities, joint venture partners, major customers and governments[89].

4.6.21 In relation to Ramp-up, PEG explains that the CECF "*should not assume a trouble free start-up. It is not unusual in the early stage of a new project (or substantial expansion) to observe operating performance which is below the target level. It is therefore important to consider whether lower product quality, lower metallurgical recovery, slower market penetration and/or higher unit costs should be assumed in the early stage of a new project*"[90].

4.6.22 As I explain in Section 4.4 above, the deferral of cash inflows in a DCF analysis leads to a decrease in the computed NPV, even if total cumulative cashflows remain un-impacted. As such, the Ramp-up and annual steady-state production of the mine can have a significant impact upon the computed NPV, even if the total LOM production is unchanged, as explained in the table below:

[88] Paul Dupree, General Manager Resource Strategy and Technical ("**Mr Dupree**") defines "Steady-state" as the "[annual] *production goal of a given mine*". Mr Dupree deposition transcript, dated 20 February 2019, page 44
[89] PEG, Volume 2, page 29, Section 7.2.2 [RT_SEC_00115484 to RT_SEC_00115541]
[90] PEG, Volume 2, page 29, Section 7.2.2 [RT_SEC_00115484 to RT_SEC_00115541]

Table 4G: The impact of Ramp-up and steady-state production on the computed NPV

	Increase in computed NPV	Decrease in computed NPV
Ramp-up	If the period of Ramp-up is brought forward, this will increase the computed NPV. This is because cashflows will be pulled forward in the NPV computation, and the impact of discounting is consequently less.	If the period of Ramp-up is delayed, this will decrease the computed NPV. This is because cashflows will be deferred in the NPV computation, and the impact of discounting is consequently more.
Annual steady-state production	If the annual steady-state production of the mine is increased, this will increase the computed NPV. This is because the increase in steady-state production will pull forward cashflows and the impact of discounting on these cashflows is reduced.	If the annual steady-state production of the mine is decreased, this will decrease the computed NPV. This is because the decrease in steady-state production will defer cashflows and the impact of discounting on these cashflows is increased.

4.6.23 In Section 10.3 below, I analyse the Ramp-up and annual steady-state production assumptions adopted in Rio Tinto's valuations undertaken in the Post Transaction Period. I identify that, given the availability of the workforce and mining equipment, and the available logistics solutions, the Ramp-up and annual steady-state production assumptions in certain of Rio Tinto's valuations were not CECF and/or were not realistic estimates.

Cost estimation

4.6.24 PEG explains that:

"*It is critical that all anticipated costs are included for the project's entire lifecycle (from study to implementation, operation and closure) and that the costs are central estimates*"[91].

4.6.25 There are two principal types of costs: "**Capital Costs**" and "**Operating Costs**".

<u>Capital Costs</u>

4.6.26 PEG explains that there are three types of Capital Costs[92]:

(a) "*Initial capital prior to commercial production, including all capital required to bring the project to its proposed full annual capacity*". I refer to these costs as "**Development Capital**";

[91] PEG, Volume 2, page 30, Section 7.3 [RT_SEC_00115484 to RT_SEC_00115541]
[92] PEG, Volume 2, page 30, Section 7.4 [RT_SEC_00115484 to RT_SEC_00115541]

(b) "*Sustaining and replacement capital expended during the operational life of the asset*". I refer to these costs as "**Sustaining Capital**"; and

(c) "*Closure capital, including post closure monitoring*". I refer to these costs as "**Closure Capital**".

4.6.27 PEG also requires that "*Contingency must be assessed and included in every capital cost estimate to account for the cost exposure inherent in the basic estimate. Proven theory states that the possible range of a capital cost estimate has a skewed distribution, with a significantly greater chance of cost over-run than under-run. It is expected that all contingency monies will be required and spent in the execution of the project*"[93]. This approach is consistent with my experience of contingencies in a cost estimate.

4.6.28 PEG provides the following guidance on the accuracy of Capital Cost estimates depending upon the stage of development of the project:

Table 4H: PEG guidance on the accuracy of Capital Cost estimates[94]

	Capital Cost accuracy
Order of Magnitude	- 20% to +35%
Pre-feasibility	- 15% to +25%
Feasibility	- 10% to +15%

4.6.29 In Sections 11.4 and 12.2 below, I analyse the Capital Cost assumptions adopted in Rio Tinto's valuations undertaken in the Post Transaction Period. I identify that Rio Tinto did not include all Capital Costs (in particular Capital Costs relating to transport) in certain of its valuations. The facts and circumstances that existed in the Post Transaction Period (according to the contemporaneous documents) suggest that Rio Tinto was aware of the requirement for these Capital Costs. The failure to include these costs is therefore a breach of PEG and means that these valuations were not a CECF.

[93] PEG, Volume 2, page 31, Section 7.4.2.1 [RT_SEC_00115484 to RT_SEC_00115541]
[94] PEG, Volume 2, page 30, Section 7.3 [RT_SEC_00115484 to RT_SEC_00115541]

Operating Costs

4.6.30 As explained in PEG[95], Operating Costs are either fixed or variable. Variable costs are required to be included in a model at a cost per unit.

4.6.31 Operating Costs typically include:

(a) "*site*" operating costs, comprising mining costs, processing costs and sustaining costs; and

(b) "*off-site*" operating costs, comprising transport costs, royalties and carbon costs.

4.6.32 As with Capital Costs, PEG provides guidance on the accuracy of Operating Costs estimates depending upon the stage of development of the project, as follows:

Table 4I: PEG guidance on the accuracy of Operating Costs estimates[96]

	Operating Costs accuracy
Order of Magnitude	+/- 20% to 30%
Pre-feasibility	+/- 10% to 20%
Feasibility	+/- 5% to 10%

Tax

4.6.33 PEG explains that the CECF analysis should "*include provision for all corporate income and withholding taxes that will be incurred to return the cash flows to Rio Tinto*"[97] and "[i]*n addition to the taxes paid in the host country, the* [DCF] *must include all dividend and/ or interest withholding taxes payable to remit cash flows to Rio Tinto*"[98].

4.6.34 Further:

"*If the applicable tax rules are expected to change this should be reflected in the central estimate case if it is certain. Where tax rules may change but it is not yet certain, the central*

[95] PEG, Volume 2, page 36, Section 7.5.1 [RT_SEC_00115484 to RT_SEC_00115541]
[96] PEG, Volume 2, page 30, Section 7.3 [RT_SEC_00115484 to RT_SEC_00115541]
[97] PEG, Volume 2, page 42, Section 7.7.1 [RT_SEC_00115484 to RT_SEC_00115541]
[98] PEG, Volume 2, page 42, Section 7.7.1 [RT_SEC_00115484 to RT_SEC_00115541]

estimate case should reflect the current tax laws with the proposed changes modelled as a sensitivity"[99].

4.6.35 In certain countries tax incentives may exist to encourage investment, such as an exemption for a limited period. With respect to tax incentives, PEG sets out that "[t]*he central estimate case should only assume these allowances if they are expected to occur*"[100].

Working capital

4.6.36 PEG explains that "[w]*orking capital is the cash investment required, in addition to the cost of property, plant and equipment and the other initial costs* […], *to enable the project to achieve and maintain the required operating performance. It can have material impact on the project NPV*"[101].

4.6.37 Further "*Working capital forecasts should recognise the impact of inventory, the cash flow delay in receiving payment for sales* … [and] … *the cash flow delay in having to pay for costs*"[102].

Discount rate

4.6.38 PEG sets out that the project discount rate should be calculated as follows:

"*Rio Tinto's standard discount rate + a country discount rate premium*"[103].

4.6.39 PEG also sets out that Rio Tinto's standard discount rate is based on the weighted average cost of capital (or WACC) which is calculated as follows:

"*WACC = (proportion of capital raised through equity × cost of equity) + (proportion of capital raised through debt × after tax cost of debt)*"[104].

4.6.40 The country discount rate premium is "*used to represent externally-driven risks that could impact Rio Tinto's return on investment. Such risks include the outright expropriation of a project (through nationalisation or civil unrest); partial expropriation by governments;*

[99] PEG, Volume 2, page 43, Section 7.7.1 [RT_SEC_00115484 to RT_SEC_00115541]
[100] PEG, Volume 2, page 44, Section 7.7.3 [RT_SEC_00115484 to RT_SEC_00115541]
[101] PEG, Volume 2, page 41, Section 7.6 [RT_SEC_00115484 to RT_SEC_00115541]
[102] PEG, Volume 2, page 41, Section 7.6 [RT_SEC_00115484 to RT_SEC_00115541]
[103] PEG, Volume 1, page 22, Section 5.7.1 [RT_SEC_00115452 to RT_SEC_00115483]
[104] PEG, Volume 1, page 22, Section 5.7.2.1 [RT_SEC_00115452 to RT_SEC_00115483]

'creeping losses' from unfavourable changes to taxes, regulations and future requests for downstream activities"[105].

[105] PEG, Volume 1, page 22, Section 5.7.3 [RT_SEC_00115452 to RT_SEC_00115483]

5 How was Rio Tinto required to conduct the impairment test in relation to the RTCM Assets at the Relevant Period End?

5.1 Introduction

5.1.1 In this Section I identify how Rio Tinto was required to conduct the impairment test in relation to the RTCM Assets at the Relevant Period End. Specifically, I address in turn:

(a) the RTCM Assets to be tested for impairment (**Section 5.2**);

(b) the requirement to assess the "*recoverable amount*" (**Section 5.3**);

(c) a "*fair value less costs to sell*" ("**FVLCS**") assessment of the recoverable amount (**Section 5.4**);

(d) the Plan NPVs, which are the starting point for Rio Tinto's assessment of the FVLCS (**Section 5.5**); and

(e) the adjustments that are required to the Plan NPVs to assess FVLCS (**Section 5.6**).

5.1.2 The explanations in this Section are based upon:

(a) the requirements of IFRS, and specifically IAS 36 "*Impairment of Assets*" ("**IAS 36**")[106];

(b) the accounting policies disclosed in Rio Tinto's 2011 Annual Financial Statements[107], Rio Tinto's 2012 Interim Financial Statements[108] and Rio Tinto's 2012 Annual Financial Statements[109];

(c) Rio Tinto's contemporaneous guidance (which I understand reflects the requirements of IFRS), including:

[106] Including the explanations provided in Section 11 of Brice 1
[107] As set out in Note 1(i) of Rio Tinto's 2011 Annual Financial Statements, page 142
[108] As set out in Note (a) to the Income Statement in Rio Tinto's 2012 Interim Financial Statements, page 27
[109] As set out in Note 1(i) of Rio Tinto's 2012 Annual Financial Statements, page 151

(i) the Controller's Manual of Rio Tinto, version dated 30 May 2007 (the "**Controller's Manual**")[110], in particular C360 "*Impairment of Non-Current Assets*"[111];

(ii) an undated paper from Dan Larsen, Group Financial Controller, RTHQ ("**Mr Larsen**") to the Rio Tinto Audit Committee, titled "*Paper on Impairment review process*" (the "**Impairment Process Paper**")[112];

(iii) a briefing note prepared by Jeffrey Mahoney, Manager – Integrated Planning, RTHQ ("**Mr Mahoney**") titled "*Net present value ("NPV") templates for financial reporting and business evaluation*", dated 14 August 2012 (the "**NPV Templates Briefing**")[113]; and

(iv) an internal memo prepared by RT Controllers titled "*Impairment Methodologies 2012*", dated 31 August 2012 (the "**Impairment Methodologies Memo**")[114];

(d) Rio Tinto's impairment reviews undertaken in relation to RTCM in November 2012 and January 2013, including:

(i) a draft paper prepared by Mr Larsen for the RTCM Audit Committee titled "*Review of Rio Tinto Coal Mozambique ('RTCM') Carrying Value Project Mercury*", dated 23 January 2013 (the "**Audit Committee Carrying Value Paper**")[115];

(ii) "*Impairment Valuation Confirmation*", signed by Matthew Halliday, Chief Financial Officer, RTE ("**Mr Halliday**") on 25 January 2013 relating to RTCM (the "**First RTCM Impairment Confirmation**")[116];

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[110] I understand that the "*Controllers*" were responsible for financial reporting within Rio Tinto and that the Controllers regulated a compilation of policies and procedures that were documented in a manual, being the Controller's Manual. Brice 1, Section 3.4

[111] Controller's Manual (C360 Impairment of Non-Current Assets) [RT_SEC_00011971 to RT_SEC_00011982]

[112] Impairment Process Paper [RT_SEC_00219245 to RT_SEC_00219246]

[113] NPV Templates Briefing [RT_00373546 to RT_00373550]

[114] Internal memo, titled "*Impairment Methodologies 2012*", dated 31 August 2012 [RT_00101098 to RT_00101101]

[115] Audit Committee Carrying Value Paper [RT_SEC_00218115 to RT_SEC_00218160]

[116] First RTCM Impairment Confirmation [RT_00258742]

(iii) "*Impairment Valuation Confirmation*", signed by Mr Halliday on 30 January 2013 relating to RTCM (the "**Second RTCM Impairment Confirmation**")[117]; and

(e) witness testimony of Laura Barbrook and Delwin Witthoft.

5.2 The assets to be tested for impairment are the RTCM CGU

5.2.1 Impairment tests are undertaken on an individual asset or on a "*cash generating unit*" or "**CGU**"[118]. A CGU is the "*smallest identifiable group of assets that generates cash inflows that are largely independent of the cash inflows from other assets or groups of assets*"[119].

5.2.2 In my report, I am therefore concerned with the CGU relevant to RTCM (the "**RTCM CGU**"). The RTCM CGU at acquisition comprised of the following:

Table 5A: The initial carrying amount of the RTCM CGU[120]

	Carrying amount
	US$'m
Benga	1,802
Zambeze	1,619
Tete East	178
Other assets and liabilities	91
Cash	478
	4,168
Goodwill	530
Deferred tax liability	(1,009)
Total carrying amount	**3,689**

[117] Second RTCM Impairment Confirmation [RT_00258850]
[118] Rio Tinto's 2011 Annual Financial Statements, page 143; Rio Tinto's 2012 Annual Financial Statements, pages 288 to 291; Impairment Process Paper, page 1 [RT_SEC_00219245 to RT_SEC_00219246]
[119] IAS 36, paragraph 6
[120] Brice 1, Table 4E

5.2.3 As I explain in Section 6, whilst not part of the Transaction (and thus not included in Table 5A above), Minjova was also on occasion included in discussions relating to the RTCM Assets[121].

5.3 The assessment of the "*recoverable amount*"

5.3.1 Pursuant to IAS 36, in an impairment test, the "*recoverable amount*" of a CGU is compared with its "*carrying value*"[122] (the "*carrying value*" is the amount an asset or liability is recorded in the financial statements). An impairment is then required if the CGU's carrying value exceeds its computed recoverable amount[123].

5.3.2 The recoverable amount of a CGU is the higher of[124]:

(a) the CGU's "*value in use*" ("**VIU**"). The VIU is the NPV of future cashflows expected to be generated through the use of the asset. Assessment of VIU therefore requires computation of the expected cash inflows and cash outflows to be derived from the continuing use and ultimate disposal of the asset, discounted to the present value[125]; and

(b) the CGU's FVLCS. The FVLCS is the amount that could be obtained from selling the CGU in an arm's length transaction between knowledgeable, willing parties, less the costs of disposal[126].

5.3.3 In relation to the RTCM CGU, Rio Tinto concluded that the assessed FVLCS will be higher than VIU because VIU would only include the current mining operation at Benga[127].

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[121] Mr Brice has identified that Minjova does not appear to have been formally transferred into the RTCM CGU. Brice 1, paragraph 6.6.4

[122] Rio Tinto's 2011 Annual Financial Statements, page 143; Income Statement in Rio Tinto's 2012 Interim Financial Statements, page 27; Rio Tinto's 2012 Annual Financial Statements, page 151; Controller's Manual (C360 Impairment of Non-Current Assets), paragraph 1.1 [RT_SEC_00011971 to RT_SEC_00011982]; IAS 36, paragraph 6

[123] Rio Tinto's 2011 Annual Financial Statements, page 143; Income Statement in Rio Tinto's 2012 Interim Financial Statements, page 27; Rio Tinto's 2012 Annual Financial Statements, page 151; Controller's Manual (C360 Impairment of Non-Current Assets), paragraph 1.1 [RT_SEC_00011971 to RT_SEC_00011982]; IAS 36, paragraph 6

[124] Controller's Manual (C360 Impairment of Non-Current Assets), paragraph 1.2 [RT_SEC_00011971 to RT_SEC_00011982]; IAS 36, paragraph 6

[125] Controller's Manual (C360 Impairment of Non-Current Assets), paragraph 1.3 [RT_SEC_00011971 to RT_SEC_00011982]; IAS 36, paragraph 31

[126] Controller's Manual (C360 Impairment of Non-Current Assets), paragraph 1.5 [RT_SEC_00011971 to RT_SEC_00011982]; IAS 36, paragraph 6

[127] January 2013 Impairment Paper, page 10 [RT_00257820 to RT_00257836]

5.3.4 Therefore, if Rio Tinto had undertaken an impairment test in relation to RTCM at the Relevant Period End, Rio Tinto would have:

(a) assessed the recoverable amount of the RTCM CGU by reference to its FVLCS; and

(b) compared the computed FVLCS with the CGU's carrying value.

5.4 A FVLCS assessment of the recoverable amount

5.4.1 IAS 36 provides a hierarchy for determining an asset's or CGU's FVLCS. This hierarchy is then also reflected in the Controller's Manual[128];

(a) first, if there is a "*binding sale agreement in an arm's length transaction*", this agreement would provide the "*best evidence*" of the CGU's FVLCS;

(b) if no binding sale agreement exists but the "*asset is traded in an active market*", the market price can be used to determine the CGU's FVLCS; and

(c) finally, if no binding sale agreement nor active market for the CGU exists, FVLCS is based upon the "*best information available to reflect the amount that an entity could obtain in an arm's length transaction less disposal costs*".

5.4.2 Applying this hierarchy to the RTCM assets, it is clear that no "*binding sale agreement*" existed at the Relevant Period End, and that the RTCM Assets were not traded in an active market. Therefore, assessment of the FVLCS of the RTCM Assets would have been based upon the "*best information available*". The Controller's Manual further explains that, in relation to Rio Tinto, the "*best information available*" may be the "*net present value of expected future cash flows*"[129]. It is also clear from the available information that what is described by Rio Tinto as the "*Plan NPV*"[130] is the starting point for this assessment; the

[128] Controller's Manual (C360 Impairment of Non-Current Assets), paragraphs 6.1 to 6.3 [RT_SEC_00011971 to RT_SEC_00011982]

[129] Controller's Manual (C360 Impairment of Non-Current Assets), paragraph 6.3 [RT_SEC_00011971 to RT_SEC_00011982];

[130] Rio Tinto's 2011 Annual Financial Statements, page 143 and Rio Tinto's 2012 Annual Financial Statements, page 152, refer to "*long-term mine plans, which are based on detailed research, analysis and iterative modelling to optimise the level of return from investment, output and sequence of extraction*"; Controller's Manual (C360 Impairment of Non-Current Assets) [RT_SEC_00011971 to RT_SEC_00011982], and Impairment Process Paper, page 1: "*Business Units prepare detailed cash flows, based on the life-of-mine plans, which are updated annually as part of the Plan process*" [RT_SEC_00219245 to RT_SEC_00219246]

Controller's Manual further explains that the Plan NPV is the valuation included in the "*annual Plan submissions*"[131].

5.4.3 The reason the Plan NPV is only the "*starting point*" for the assessment is because adjustments are then required to ensure that the FVLCS is assessed using the assumptions of a market participant (and not of Rio Tinto)[132]. Therefore, if Rio Tinto had undertaken an impairment test in relation to RTCM at the Relevant Period End, Rio Tinto would have assessed the RTCM CGU's FVLCS by reference to the Plan NPV, adjusted where relevant for the assumptions of a market participant.

5.4.4 When computing the FVLCS, the assumptions should reflect:

(a) the "*best information available*"[133]. Where information becomes available after the end of the reporting period but before the financial statements have been issued, the entity is required to consider whether the information reflects conditions at the end of the reporting period;

(b) "*management's best estimates*"[134]. Mr Brice explains further that, if as a result of uncertainty, it is only possible to undertake the impairment test using high level assumptions or risk weighted assumptions, such an approach is permitted under IFRS[135];

(c) a CECF ("*should neither be unduly optimistic nor pessimistic, but fully and equally reflect both upside and downside*"[136]):

(i) "*The impairment review is based on the base case (central estimate)*"[137]; and

[131] Controller's Manual (C360 Impairment of Non-Current Assets), paragraph 1.4 [RT_SEC_00011971 to RT_SEC_00011982]
[132] Rio Tinto's 2011 Annual Financial Statements, page 143; Rio Tinto's 2012 Annual Financial Statements, page 152
[133] Rio Tinto's 2011 Annual Financial Statements, page 143; Rio Tinto's 2012 Annual Financial Statements, page 152; Controller's Manual (C360 Impairment of Non-Current Assets), paragraph 6.3 [RT_SEC_00011971 to RT_SEC_00011982]
[134] Rio Tinto's 2011 Annual Financial Statements, page 143; Rio Tinto's 2012 Annual Financial Statements, page 152
[135] Brice 1, paragraph 11.5.4
[136] PEG, Volume 1, page 21, Section 5.6 [RT_SEC_00115452 to RT_SEC_00115483]
[137] Impairment Process Paper, page 2 [RT_SEC_00219245 to RT_SEC_00219246]

(ii) "*The cash flow forecast should be a central estimate with an equal upside and downside risk*"[138];

(d) a neutral depiction, pursuant to the Conceptual Framework for Financial Reporting (the "**Conceptual Framework**")[139]. A neutral depiction is explained to be "*without bias in the selection or presentation of financial information*" and "*not slanted, weighted, emphasised, de-emphasised or otherwise manipulated to increase the probability that financial information will be received favourably or unfavourably by users*"[140];

(e) "*…non-reserve material is only included where there is a high degree of confidence in its economic extraction*"[141]; and

(f) in relation to what are described as "*growth projects*", they should be included "*at the risk adjustments agreed upon by local management and Controllers*"[142].

5.5 The Plan NPVs – the starting point for Rio Tinto's assessment of the FVLCS

5.5.1 In this Section I identify what are referred to as the "*Plan NPVs*" which, as explained above, are the starting point for Rio Tinto's assessment of the FVLCS.

5.5.2 A document titled "*Rio Tinto: Financial Management Overview*", dated August 2011[143] (the "**Financial Management Overview**"), sets out the reporting lines, planning and budgeting processes, systems and controls and reporting and accounting requirements at Rio Tinto. The Financial Management Overview refers to Rio Tinto's "*Integrated Planning Process*", which includes what are described as the "*Strategic plan*", the "*Business plan*" and the "*Annual plan*"[144]. It summarises the differences between these plans as follows:

[138] NPV Templates Briefing, page 2 [RT_00373546 to RT_00373550]
[139] The Conceptual Framework was issued by the IASB in September 2010 and sets out "*the concepts that underlie the preparation and presentation of financial statements for external users*"
[140] Conceptual Framework, paragraph QC14, page 87
[141] Rio Tinto's 2011 Annual Financial Statements, page 143; Rio Tinto's 2012 Annual Financial Statements, page 152
[142] Internal memo, titled "*Impairment Methodologies 2012*", dated 31 August 2012, page 3 [RT_00101098 to RT_00101101]; the Audit Committee Carrying Value Paper, page 5, explains that certain amounts included in the January 2013 Impairment "*were risk adjusted by a probability weighting to reflect the relative uncertainty around values*" [RT_SEC_00218115 to RT_SEC_00218160]
[143] Financial Management Overview [RT_SEC_00120730 to RT_SEC_00120769]
[144] Financial Management Overview, page 10 [RT_SEC_00120730 to RT_SEC_00120769]

Figure 5A: Rio Tinto's integrated planning process[145]

5.5.3 I therefore understand that Rio Tinto's planning processes comprised:

(a) a strategic plan, which considered the long-term project from a "macro level" and is updated annually (the "**Strategic Plan**");

(b) a business plan, which considers the project over the next five years, with two years being considered in detail and three being considered from a macro level, and is updated annually (the "**Five Year Business Plan**"); and

(c) an annual plan which considers the next two years of the project in detail, is updated annually and is re-forecast quarterly (the "**AOP**" or "**Annual Operating Plan**").

5.5.4 In relation to the AOP, the Financial Management Overview explains that[146]:

"The budget for each Rio Tinto Business Unit or Function is re-forecast quarterly, in conjunction with the group-wide quarterly process of cost reporting.

[145] Financial Management Overview, page 11 [RT_SEC_00120730 to RT_SEC_00120769]
[146] Financial Management Overview, page 12 [RT_SEC_00120730 to RT_SEC_00120769]

Each re-forecast includes the year to date actual costs with the remaining period re-projected, using the same approach and level of detail regarding resources and cost, as was undertaken in developing the annual financial plan. As such, for the 2011 year:

• Q1 Forecast – Jan & Feb actuals + 10 months of remaining 2011 + 2012 re-forecast

• Q2 Forecast – Jan to May actuals + 7 months of remaining 2011 + 2012 re-forecast

• Q3 Forecast – Jan to Sep actuals + 3 months of remaining 2011 + 2012/2013 plan".

5.5.5 A draft document titled "*Rio Tinto 11Q3 Annual Operating Plan Guidelines*", dated 12 August 2011 (the "**11Q3 AOP Guidelines**")[147] further explains that:

"[The] RT *AOP cycle referred to as the 11Q3, covers the forecast periods from 2011 to 2016. Years 2011 to 2013 are completed in detail, years 2014 to 2016 are completed at a high level, providing a line of sight for future developments*"[148].

"*AOP is to be presented* [sic] *the Rio Tinto Energy Product Group for approval in the week of the **26 September 2011** it is then consolidated with the other Energy Product Group Business Unit's (BU) for presentation on the **8 November 2011** to the RT Plan Review Committee*"[149].

5.5.6 This AOP reporting process is also explained by Mr Morris[150].

5.5.7 Of particular relevance to the planning process is Rio Tinto's "*Plan Review Committee*" (or "**PRC**")[151] which is responsible for reviewing and approving key plan submissions throughout the course of the yearly planning programme[152]. The Financial Management Overview explains that the PRC would meet three times in a calendar year, as follows[153]:

(a) April (referred to as "*PRC 1*"): to review the Group's Q1 forecast and discuss the status of the Group's capital pipeline and project development activities;

[147] 11Q3 AOP Guidelines [RT_00479150 to RT_00479157]
[148] 11Q3 AOP Guidelines, page 2 [RT_00479150 to RT_00479157]
[149] 11Q3 AOP Guidelines, page 2 [RT_00479150 to RT_00479157]
[150] Mr Morris deposition transcript, dated 8 November 2018, pages 126 and 127
[151] Mr Albanese chaired the PRC and Mr Elliott also sat on the PRC
[152] Financial Management Overview, page 13 [RT_SEC_00120730 to RT_SEC_00120769]
[153] Financial Management Overview, pages 13 and 14 [RT_SEC_00120730 to RT_SEC_00120769]

(b) July (referred to as "*PRC 2*"):

(i) presentation of the AOPs for each Rio Tinto function. Following "*in principle*" approval by the PRC, these plans are refreshed with Q3 assumptions and form the basis of functional charges distributed to Business Units in August/ September; and

(ii) presentation of the Five Year Business Plan for each Rio Tinto Product Group. A consolidated Five Year Business Plan for the Group is presented in August; and

(c) November (referred to as "*PRC 3*"): presentation of AOPs for each Rio Tinto Product Group. The AOP submission will include an update of the business unit valuation models. The AOP will be presented to the Board in December for approval.

5.5.8 I have also identified a number of presentations which correlate to the above PRC process and include reference to RTCM.

5.6 The adjustments required to the Plan NPVs to assess the FVLCS

5.6.1 As identified in Section 5.4 above, the Plan NPVs are only the "*starting point*" for the assessment of FVLCS because adjustments are then required to ensure that the FVLCS is assessed using the assumptions of a market participant (and not of Rio Tinto).

5.6.2 The Controller's Manual requires that, when computing the recoverable amount of an asset or CGU in the context of an impairment test:

"[Business Units] *should ensure that the valuation models are reliable and in accordance with Rio Tinto guidelines,* […] *or otherwise determined to be the most appropriate. Where impairment charges or reversals are required, a standard form of report from the BU CFO will be required, confirming that the valuation used complies with the above*"[154].

5.6.3 This "s*tandard form of report*" is provided in the Controller's Manual and requires the CFO of the Business Unit to complete the following section:

[154] Controller's Manual (C360 Impairment of Non-Current Assets), paragraph 2.3 [RT_SEC_00011971 to RT_SEC_00011982]

"*The assumptions in this valuation differ from those used in the Plan NPV in the following respects and for the following reasons*"[155].

5.6.4 I have identified two versions of this report in relation to the January 2013 Impairment of RTCM, being the First RTCM Impairment Confirmation and the Second RTCM Impairment Confirmation. The assumptions differing to the Plan NPV referred to in these forms were as follows:

(a) discount rate: both the First RTCM Impairment Confirmation and the Second RTCM Impairment Confirmation explain that "*7.9% discount rate (real post-tax, 6.9% + 1% for country risk) applied to all cash flow, including closure, as per advice from Rio Tinto Controllers*"[156]. Therefore, Rio Tinto adjusted the discount rate included in the Plan NPV to be the discount rate of a market participant;

(b) incremental values: both the First RTCM Impairment Confirmation and the Second RTCM Impairment Confirmation explain that "*Incremental values were included based upon probabilistic assessments*"[157]. Therefore, Rio Tinto provided a probabilistic assessment (which might also be described as a risk weighting) of certain components of the RTCM Assets in the FVLCS assessment because this was determined to be the approach of a market participant; and

(c) commodity prices: the First RTCM Impairment Confirmation explains that "*PEG coking coal pricing was used until the year 2045 from which point it was levelled (which had no material impact in the outer years of the valuation). Nov. PEG thermal coal pricing was used until 2040 from which point it was levelled at $108/t FOB as per advice from Rio Tinto Controllers*"[158]. There is no reference to commodity prices in the Second RTCM Impairment Confirmation.

5.6.5 Therefore, the principal adjustments required to the Plan NPV are the discount rate and the inclusion of probabilistic assessments of incremental values.

[155] Controller's Manual (C360 Impairment of Non-Current Assets) [RT_SEC_00011971 to RT_SEC_00011982]
[156] First RTCM Impairment Confirmation [RT_00258742]; Second RTCM Impairment Confirmation [RT_00258850]
[157] First RTCM Impairment Confirmation [RT_00258742]; Second RTCM Impairment Confirmation [RT_00258850]
[158] First RTCM Impairment Confirmation [RT_00258742]

5.7 Conclusion

5.7.1 Pursuant to International Financial Reporting Standards, the accounting policies disclosed by Rio Tinto in its financial statements, and the requirements set out in Rio Tinto's Controller's Manual, if Rio Tinto had undertaken an impairment test in relation to RTCM as of 30 June 2012, Rio Tinto would have been required to:

(a) assess the recoverable amount of the RTCM CGU by reference to its FVLCS; and

(b) compare the computed FVLCS with the RTCM CGU's carrying value.

5.7.2 In assessing the FVLCS of the RTCM CGU, Rio Tinto would have:

(a) based its assessment on Plan NPVs produced in accordance with PEG; and

(b) made adjustments to ensure that the assumptions adopted in the NPV assessment are of a market participant. If Rio Tinto had followed the same process that is used in the November 2012 and January 2013 impairment tests, Rio Tinto would have adjusted the discount rate and included incremental values based upon probabilistic assessments.

6 Rio Tinto's contemporaneous assessments of the NPV of the RTCM Assets

6.1 Introduction

6.1.1 In this Section, I identify and consider Rio Tinto's contemporaneous assessments of the NPV of the RTCM Assets. Specifically:

(a) I first provide an overview of the DCF models that have been provided to me (**Section 6.2**);

(b) I then address each of the main series of DCF model (**Sections 6.3 to 6.5**), including identifying the DCF models which will be the focus of the remainder of my report (collectively, the "**Key Models**"); and

(c) finally, I summarise the computed outputs of the Key Models (**Section 6.6**).

6.2 Overview of the DCF models provided to me

Identification of the DCF models

6.2.1 I have been provided with over 50,000 Microsoft Excel spreadsheets. These spreadsheets include:

(a) DCF models computing the NPV of the RTCM Assets and other Rio Tinto assets; and

(b) analyses and other spreadsheets contemporaneously produced by Rio Tinto individuals, such as data underpinning graphs produced in internal Rio Tinto presentations.

6.2.2 Included within these spreadsheets, I have identified 350 DCF models, all of which include an assessment of the NPV of the RTCM Assets[159, 160]. Not all of these DCF models are complete and include final NPV assessments – many of these models appear to be draft / work

[159] These DCF models are summarised in **Appendix D**. There are two DCF models ([RT_00185960] and [RT_SEC_00295003]) which do not include a valuation of RTCM

[160] I identified these models by reference to their size – DCF models are significantly larger (in bytes) than other contemporaneously produced spreadsheets

in progress versions of an NPV assessment that was in the process of being produced by Rio Tinto.

The three series of DCF models

6.2.3 There are three principal series of DCF model, each with a number of iterations[161]:

(a) the "**Acquisition Format**". This series is the format used by Rio Tinto when it initially assessed the value of Riversdale (that is, prior to the Transaction). There are in total 151 iterations (including duplicates) of the Acquisition Format model; and

(b) the "**Maglione Format**". As I explain in Section 6.4 below, in early 2012 Mr Marcantonio Maglione, Manager – Business Analysis, RTCM ("**Mr Maglione**") was instructed to produce a new financial model in relation to the RTCM Assets. There are in total 187 iterations (including duplicates) of the Maglione Format model; and

(c) the "**Group Valuation Format**". In these models, the RTCM Assets formed only part of the assets being assessed – the model also included DCF models of the other CGUs in the Rio Tinto Energy Product Group. There are in total nine iterations of the Group Valuation Format model.

6.2.4 Each of these three series of DCF model is structured differently, for example, with different input worksheets, different methodologies of computing the NPV, and different summary worksheets. For example, in relation to the "*Summary*" worksheet (which provided the output of the computed NPV):

(a) the Acquisition Format models contain a "*Summary*" worksheet which presents the computed NPV across the different mines/projects as follows:

[161] I note that I have also identified three models which are not in the Acquisition Format, Maglione Format or Group Valuation Format; [RT_00263028], [RT_00263029] and [RT_00263030]. I have not identified the purpose of these models and note that they were all last modified in November 2012 or December 2012

Figure 6A: The "*Summary*" worksheet in the Acquisition Format models

Valuation Summary

Mine/Project	Project Status	Riversdale Ownership	Valuation - Riversdale share			Include Project
			US$M	A$M	A$/share	
Benga - via barge to Chinde	Construction	65%	$1,143	$1,153	$4.7	Yes
Zambeze - 45Mtpa ROM*	Pre-Feasiblity	100%	$1,575	$1,588	$6.5	
Benga & Zambeze			**$2,719**	**$2,741**	**$11.2**	
Zululand Anthracite Colliery	Operating	74%	$30	$30	$0.1	Yes
Unallocated Overheads		100%	($16)	($16)	($0.1)	
Net Debt/Cash		100%	$545	$549	$2.2	
Outstanding Options Proceeds		100%	$64	$64	$0.3	
Subtotal			**$3,341**	**$3,368**	**$13.8**	
EL 945 - Underground Case	Exploration	100%	$344	$347	$1.4	Yes
Total Value			**$3,685**	**$3,715**	**$15.2**	
** includes 40% sale at value comparable to previous WISCO proposal*			Shares & Options:		244.4	
			value at current FX		**$15.2**	

(b) the Maglione Format models contain a summary worksheet[162] which presents the computed NPV across the different mines/projects as follows:

[162] Referred to as "*Discrete Values*"

Figure 6B: The summary worksheet in the Maglione Format models

CGU	UNIT	RTCM	TATA	GOVT	OTHER 1	OTHER 2
(Benga P 1)	NPV9 US$m REAL	280	163	23		
(Benga P 2)	NPV9 US$m REAL	281	164	23		
(Benga P 3)	NPV9 US$m REAL	0			0	0
(Benga P 4)	NPV9 US$m REAL	0			0	0
(Zambeze P 1)	NPV9 US$m REAL	379			0	0
(Zambeze P 2)	NPV9 US$m REAL	0			0	0
(Zambeze P 3)	NPV9 US$m REAL	0			0	0
(Tete East P 1)	NPV9 US$m REAL	354			0	0
(Tete East P 2)	NPV9 US$m REAL	0			0	0
(Tete East P 3)	NPV9 US$m REAL	0			0	0
(Minjova P 1)	NPV9 US$m REAL	816			0	0
(EMEM P 1)	NPV9 US$m REAL	0			0	0
(BPP Phase 1)	NPV9 US$m REAL	5	16	5		
(BPP Phase 2)	NPV9 US$m REAL	0	0	0		
(Green Field Corridor)	NPV9 US$m REAL	(2,969)			(185)	0
(Beira Port Upgrade)	NPV9 US$m REAL	0			0	0
(Barge Phase 1)	NPV9 US$m REAL	0			0	0
(Barge Phase 2)	NPV9 US$m REAL	0			0	0
(Other Infrastructure 1)	NPV9 US$m REAL	0			0	0
(Other Intrastructure 2)	NPV9 US$m REAL	0			0	0
(Corporate and Site Support)	NPV9 US$m REAL	(369)			0	0
(Sena Beira Phase 1)	NPV9 US$m REAL	(150)			0	0
(Sena Beira Phase 2)	NPV9 US$m REAL	0			0	0
(Airport Relocation)	NPV9 US$m REAL	0			0	0
(Zambeze Road Relocation)	NPV9 US$m REAL	0			0	0
(Community Relocation)	NPV9 US$m REAL	0			0	0
(Regional Fuel and Warehouse)	NPV9 US$m REAL	0			0	0
(Strategic Land Acquisition)	NPV9 US$m REAL	0			0	0
(Regional Water)	NPV9 US$m REAL	0			0	0
(Regional Offices)	NPV9 US$m REAL	0			0	0
(Regional Camp and Waste)	NPV9 US$m REAL	0			0	0
(Other Enabler)	NPV9 US$m REAL	0			0	0
Tax Consolidation Adjustments	NPV9 US$m REAL	387	12			
RTCM Operating in Mozambique	NPV9 US$m REAL			32,210		
TOTAL	**NPV9 US$m REAL**	**(987)**	**355**	**32,262**	**(185)**	**0**

*Other parties: GOVT, TATA and OTHERs curently using RT WACC

(c) the Group Valuation Format models contain a summary worksheet[163] which presents the computed NPV of the RTCM Assets alongside the computed value of other CGUs in the Rio Tinto Energy Product Group. In relation to the RTCM Assets, the computed NPV is presented across the mines/projects as follows:

Figure 6C: The summary worksheet in the Group Valuation Format models

	Product	Tab Name	Projects	RT %	Esc. %	NPV US$M Project 100%	NPV US$M RT Mgmt. Fees	NPV US$M RT %	Group Valuation Cases Committed	Group Valuation Cases Probable (Base Case)	Group Valuation Cases Possible	Group Valuation Cases Blue Sky (Market Defense)
RTCM	Coal	[illegible]	Benga	[illegible]	1.00	$1,493	-	$970	Yes	Yes	Yes	Yes
	Gas	[illegible]	Coal Bed Methane - Benga	[illegible]	1.00	-	-	-			Yes	Yes
	Electricity	[illegible]	Benga Power Plant	[illegible]	1.00	-	-	-			Yes	Yes
	Coal	[illegible]	Zambeze	[illegible]	1.00	$1,595.1	-	$1,595		Yes	Yes	Yes
	Gas	[illegible]	Coal Bed Methane - Zambeze	[illegible]	1.00	-	-	-			Yes	Yes
	Coal	[illegible]	Tete East	[illegible]	1.00	$518.4	-	$207		Yes	Yes	Yes
	Coal	[illegible]	Minjova	40.0%	1.00	$569.8	-	$228		Yes	Yes	Yes
	Coal	[illegible]	ZAC & Cash on Hand	[illegible]	1.00	$630.7	-	$631		Yes	Yes	Yes
			Total RTCM - RT Share - US$M						970	3,631	3,631	3,631

[163] Referred to as "*Consolidation*"

6.2.5 After opening a DCF model in Microsoft Excel, it is simple to identify the relevant series by reference to the format, font, colours, style and general layout of the workbooks contained therein.

100% Share and RT Share

6.2.6 When reviewing the computed output of the DCF models, it is important to draw a distinction between:

(a) what I will refer to as "**100% Share**". This is the total of the FCFs generated by the RTCM Assets, irrespective of the percentage owned by Rio Tinto; and

(b) what I will refer to as "**RT Share**". This is Rio Tinto's share of the FCFs generated by the RTCM Assets.

6.2.7 For example, if the total NPV of Benga (of which Rio Tinto initially owned 65%) was assessed to be, say, US$100 million, the 100% Share NPV would be US$100 million and the RT Share NPV would be US$65 million (being US$100 million × 65%).

The computed NPVs in the DCF models

6.2.8 When comparing the computed NPVs in the DCF models, it is important to ensure the comparison is made on a like-for-like basis. For example, whilst the NPVs computed in the Acquisition Format models include a balance of cash, the Maglione Format models do not include cash[164]. Therefore, to compare the Maglione Format models with the Acquisition Format models, it is necessary to strip out the balance of cash from the Acquisition Format models. As such, in my report, where I identify or refer to a computed NPV (or the impact on a computed NPV), this is a reference to the NPV excluding cash. This approach is helpful given that:

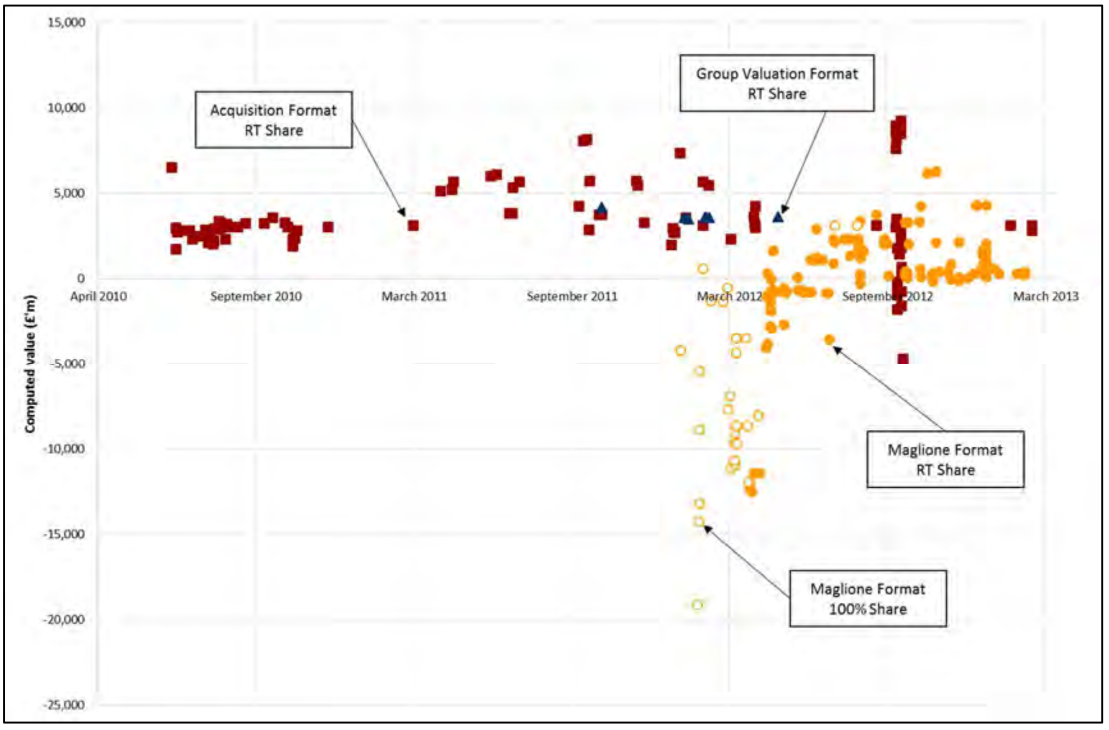
(a) Mr Brice explains that the impairment test in relation to the RTCM Assets should be undertaken excluding cash[165]; and

[164] The balance of cash is not clear in the Group Valuation Format models
[165] Brice 1, paragraphs 11.5.2 to 11.5.3

(b) in the January 2013 Impairment test, the assessment of the FVLCS of the RTCM CGU excludes the balance of cash[166].

6.2.9 In Figure 6D below, I summarise the available DCF models by reference to their computed NPVs and the last modified date of each model[167]. I also identify the relevant series of model (that is, whether the DCF model is Acquisition Format, Maglione Format or Group Valuation Format). Whilst most of the DCF models include an assessment of the RT Share, there are 31 Maglione Format models which only computed a 100% Share – these are also separately identified in Figure 6D:

Figure 6D: Summary of the computed values of the available DCF models[168]



6.2.10 I now address the Acquisition Format models, the Maglione Format models and the Group Valuation Format models in turn, including identifying the Key Models which will be the focus of the remainder of my report.

6.2.11 In my view, in order to be able to rely upon a model, it is important to ensure that the output of the model can be reconciled to, for example, contemporaneous presentations and reports.

[166] January 2013 Impairment Paper, page 6 [RT_00257820 to RT_00257836]
[167] Importantly, the last modified date does not necessarily correspond to the date of the valuation
[168] The DCF models that I have identified are set out in **Appendix D**

This is because, in the absence of such a reconciliation, the purposes for which a model was prepared is not known. In relation to the identified Key Models, I explain below the documents to which I have been able to agree each Key Model.

6.3 The Acquisition Format models

6.3.1 As I explain in paragraph 6.2.3 above, the Acquisition Format models are the models that followed the format used by Rio Tinto when it initially assessed the value of Riversdale (that is, prior to the Transaction).

6.3.2 The first important iteration of the Acquisition Format model is dated 23 November 2010 (the "**Acquisition Model**")[169] and agrees to the final Investment Committee paper and Board approval for Rio Tinto's acquisition of Riversdale[170]. It is therefore one of the Key Models which will be the focus of the remainder of my report.

6.3.3 The Acquisition Model assumed (on a 100% Share basis) a Ramp-up of production to 2019 after which annual ROM production capacity from Benga, Zambeze and Tete East would be 21Mtpa, 45Mtpa and 6Mtpa respectively. It also assumed that, whilst a small amount of coal would initially be transported to the coast for export via the Sena Railway, the expansion beyond Benga Phase 1 would be via a 30Mtpa Barging solution.

6.3.4 The Acquisition Model has a total NPV (RT Share) of US$3,685 million, which can be summarised as follows:

[169] Acquisition Model [RT_00337763]

[170] Email from Zeb Foster, Manager – Business Development, RTE ("**Mr Foster**") to Hariish Narayanasamy, Senior Commercial Analyst, Strategy and Finance, RTE ("**Mr Narayanasamy**"), dated 26 March 2012, subject "*Riversdale Models*" [RT_00337762]

Table 6A: The Acquisition Model NPV (RT Share)[171]

	US$'m
Benga	1,143
Zambeze (including WISCO)	1,575
Tete East[172]	344
	3,063
ZAC	30
Unallocated overheads	(16)
Outstanding option proceeds	64
Total (excluding net debt / cash)	**3,140**
Net debt / cash	545
Total (including net debt / cash)	**3,685**

6.3.5 The Acquisition Model was then used as the basis for a number of other models, as explained below.

The Deloitte PPA Report

6.3.6 Mr Brice explains that pursuant to IFRS, following a transaction an entity is required to recognise and measure the identifiable assets acquired, the liabilities assumed and any non-controlling interests – this process is typically referred to as the "*purchase price allocation*" or "**PPA**"[173].

6.3.7 In the context of the PPA of the RTCM Assets, Rio Tinto instructed Deloitte Touche Tohmatsu ("**Deloitte**") to assess the value of the mineral interests acquired (being Benga, Zambeze and Tete East). Deloitte produced a report, dated 28 July 2011 (the "**Deloitte PPA Report**")[174], in which it explained the basis for its assessment of the value of these mineral interests and provided its conclusions.

[171] Email from Mr Foster to Mr Narayanasamy, dated 26 March 2012, subject "*Riversdale Models*", attachment "*Riversdale valuation 2010 11 23 Nov PEG Update*" [RT_00337762]
[172] Referred to as "*EL945 – Underground Case*" in the Acquisition Model
[173] Brice 1, paragraph 4.3.3 *et seq*
[174] Deloitte PPA Report [RT_00180990 to RT_00181048]

6.3.8 Of importance for my report, the Deloitte PPA Report specifically refers to the Acquisition Model:

"*Rio Tinto Services management prepared a cash flow model as part of the Acquisition which estimates the future cash flows to be generated by the Coal Projects (the Model). The Model has formed the basis of the projected cash flows for our discounted cash flow valuation of the Coal Projects.*

The Model includes projections of real, ungeared (i.e. before interest), after-tax cash flows in USD for each Coal Project. The Model was prepared based on:

• *forecast production profiles of the individual coal projects over the LOM of each project*

• *the latest reserve and resource statements, which are certified in accordance with the JORC Code*

• *the LOM plans for the Coal Projects*

• *an assumption that the Coal Projects will have sufficient access to rail and port infrastructure so as not to impede production*"[175].

6.3.9 Therefore, the computed values in the Deloitte PPA Report were based on the Acquisition Model[176], with certain adjustments, including[177]:

(a) in relation to "*pricing, foreign exchange rates and inflation*"[178];

(b) the discount rate[179]; and

(c) the addition of a premium for the potential discovery of additional resources from existing tenements and the potential for the LOMs to be greater than those included in the Acquisition Model[180].

[175] Deloitte PPA Report, page 19 [RT_00180990 to RT_00181048]
[176] I have also been able to agree many of the figures in the Deloitte PPA Report to the Acquisition Model
[177] Deloitte PPA Report, page 19 [RT_00180990 to RT_00181048]
[178] Deloitte PPA Report, page 19 [RT_00180990 to RT_00181048]
[179] Deloitte PPA Report, page 30 [RT_00180990 to RT_00181048]
[180] Deloitte PPA Report, page 31 [RT_00180990 to RT_00181048]

6.3.10 Whilst I have not identified in the available information the DCF model underpinning the Deloitte PPA Report (and therefore for the purposes of my report, the DCF model cannot be a Key Model), given the Deloitte PPA Report was the basis for Rio Tinto's initial carrying value of the RTCM Assets, the assumptions used in the Deloitte PPA Report are important in my analyses.

Valuation Update Models in 2011

6.3.11 I have identified that Rio Tinto produced two Acquisition Format models in mid-2011 in which certain (but not all) assumptions in the Acquisition Model were updated:

(a) what I will refer to as the "**Q2 2011 Update Model**"[181]. This model was described contemporaneously as "*the Q2 Valuation (not the Q2 acquisition)*" and in comparison with the Acquisition Model it was described as being "*simply an update of PEG pricing assumptions and the decision to retain Zambeze rather than continuing with the Riversdale strategy to sell down 40%*"[182]. Consistent with the Acquisition Model, the Q2 2011 Update Model assumed (on a 100% Share basis):

(i) a Ramp-up of production to 2019 after which annual ROM steady-state production from Benga, Zambeze and Tete East would be 21Mtpa, 45Mtpa and 6Mtpa respectively; and

(ii) whilst a small amount of coal would initially be transported to the coast for export via the Sena Railway, the expansion beyond Benga Phase 1 would be via a 30Mtpa Barging solution; and

(b) what I will refer to as the "**Q3 2011 Update Model**"[183]. This model is different to the Q3 2011 AOP (see paragraphs 6.3.14 to 6.3.19 below) but I have identified waterfall charts comparing the Q2 2011 Update Model with the Q3 2011 Update Model[184, 185].

[181] Q2 2011 Update Model [RT_00336229]. Copies of the model are also titled "*Riversdale Valuation 2011 05 12 - May PEG (retain 100% of Zambeze)*", for example [RT_00337764] which correspond to the email referenced in footnote 182 below

[182] Email from Mr Foster to Mr Narayanasamy dated 26 March 2012, subject "*Riversdale Models*" [RT_00337762]

[183] Q3 2011 Update Model [RT_00336978]

[184] On the basis that I have also identified the AOP for Q3 2011 (see paragraphs 6.3.16 *et seq* below), I have not included the Q3 2011 Update Model as a Key Model

[185] Business Valuation slide [RT_00336228]

Similar to the Q2 2011 Update Model, the Q3 2011 Update Model assumed (on a 100% Share basis):

(i) a Ramp-up of production to 2020 after which annual ROM steady-state production from Benga, Zambeze and Tete East would be 21Mtpa, 42.4Mtpa and 6Mtpa respectively; and

(ii) a small amount of coal initially being transported to the coast for export via the Sena Railway, with the remaining coal transported by a 30.6Mtpa Barging solution.

6.3.12 The table below compares the computed NPV (RT Share) in the Q2 2011 Update Model and the Q3 2011 Update Model with the computed NPV (RT Share) in the Acquisition Model:

Table 6B: The Q2 2011 Update Model and the Q3 2011 Update Model compared with the Acquisition Model (RT Share)

	Acquisition	**Q2 2011 Update**	**Q3 2011 Update**
	US$'m	***US$'m***	***US$'m***
Benga	1,143	1,764	1,466
Zambeze	1,575	2,916	2,592
Tete East	344	877	1,248
	3,063	***5,557***	***5,306***
ZAC	30	97	144
Unallocated overheads	(16)	(20)	(30)
Outstanding option proceeds	64	69	69
Total (excluding net debt / cash)	**3,140**	**5,703**	**5,490**
Net debt / cash	545	588	588
Total (including net debt / cash)	**3,685**	**6,290**	**6,077**

6.3.13 In relation to the increase in the computed value of Tete East (from US$344 million in the Acquisition Model to US$877 million in the Q2 2011 Update Model to US$1,248 million in the Q3 2011 Update Model), an email from Mr Foster to Mr Narayanasamy, dated 26 March 2012, explained that:

"*…at the time we advised that the increased value of the Tete East projects (US$0.9b* […]*) should be ignored due to the very early stage conceptual level of these projects and data, and the original value of $0.3b should be carried forward*"[186].

The AOP Models

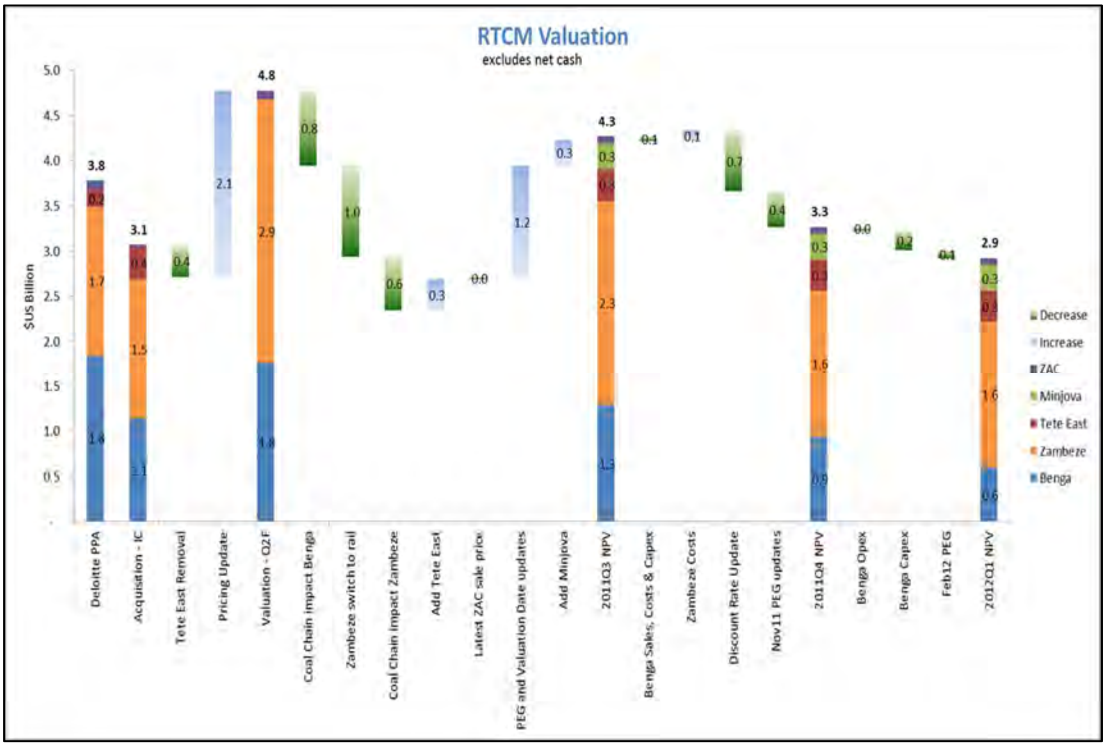
6.3.14 As I set out at Section 5.5, Rio Tinto's policy was to produce the AOP on an annual basis, but that the AOP would be re-forecast at the end of each quarter. I have identified a number of Acquisition Format models which appear to be these quarterly re-forecasts of the AOP for RTCM.

6.3.15 My starting point in this regard is a presentation, titled "*Rio Tinto Coal Mozambique 12Q1 Forecast Presentation*", dated 28 March 2012 (the "**RTCM Q1 2012 Forecast Presentation**")[187]. This presentation includes a chart setting out the value of each of the RTCM Assets as at the end of each quarter, as follows:

[186] Email from Mr Foster to Mr Narayanasamy, dated 26 March 2012, subject "*Riversdale Models*" [RT_00337762]

[187] RTCM Q1 2012 Forecast Presentation [RT_00332119 to RT_00332140]

Figure 6E: Rio Tinto's valuation of the RTCM Assets according to the RTCM Q1 2012 Forecast Presentation[188]



6.3.16 I have identified models which correspond with the Zambeze and Benga (see paragraph 6.3.19) breakdown of:

(a) the "*2011Q3 NPV*" included in the RTCM Q1 2012 Forecast Presentation (the "**Q3 2011 AOP Model**")[189];

(b) the "*2011Q4 NPV*" included in the RTCM Q1 2012 Forecast Presentation (the "**Q4 2011 AOP Model**")[190]; and

(c) the "*2012Q1 NPV*" included in the RTCM Q1 2012 Forecast Presentation (the "**Q1 2012 AOP Model**")[191].

6.3.17 The Q3 2011 AOP Model, the Q4 2011 AOP Model and the Q1 2012 AOP Model all assumed (on a 100% Share basis):

[188] RTCM Q1 2012 Forecast Presentation, page 16 [RT_00332119 to RT_00332140]
[189] Q3 2011 AOP Model [RT_00263934]
[190] Q4 2011 AOP Model [RT_00336177]
[191] Q1 2012 AOP Model [RT_00337735]

(a) a slower rate of Ramp-up of production (compared with the Acquisition Model) after which annual ROM steady-state production from Benga and Zambeze would be 21Mtpa and 42Mtpa respectively; and

(b) coal transported to the coast for export principally via the Sena Railway (82%), with the remaining amount transported via Barging (18%).

6.3.18 The table below compares the computed values (RT Share) in these models with the computed NPV (RT Share) in the Acquisition Model:

Table 6C: The Q3 2011 AOP Model, the Q4 2011 AOP Model and the Q1 2012 AOP Model compared with the Acquisition Model (RT Share)

	Acquisition	Q3 2011 AOP	Q4 2011 AOP	Q1 2012 AOP
	US$'m	*US$'m*	*US$'m*	*US$'m*
Benga	1,143	1,309	962	615
Zambeze	1,575	2,269	1,602	1,601
Tete East	344	-	-	-
	3,063	***3,578***	***2,564***	***2,216***
ZAC	30	144	137	110
Minjova	-	-	-	-
Unallocated overheads	(16)	(30)	(28)	(30)
Outstanding option proceeds	64	69	69	69
Total (excluding net debt / cash)	**3,140**	**3,761**	**2,742**	**2,364**
Net debt / cash	545	588	588	588
Total (including net debt / cash)	**3,685**	**4,349**	**3,330**	**2,952**

6.3.19 The Q3 2011 AOP Model, Q4 2011 AOP Model and Q1 2012 Model therefore all included nil values for Tete East and Minjova. However:

(a) in the chart in the RTCM Q1 2012 Forecast Presentation (see Figure 6E above), an NPV of US$344 million for Tete East was included[192]. The Q3 2011 AOP Model, Q4 2011 AOP Model and Q1 2012 Model all contain a worksheet which provided a

[192] RTCM Q1 2012 Forecast Presentation, page 16 [RT_00332119 to RT_00332140]

computed value of Tete East, but this value was excluded[193] from the "*Summary*" worksheet in the models; and

(b) in the chart in the RTCM Q1 2012 Forecast Presentation (see Figure 6E above), an NPV of US$288 million for Minjova was included[194]. The Q4 2011 AOP Model and Q1 2012 Model contain a worksheet which provided a computed value of Minjova, but this value did not pull through onto the "*Summary*" worksheet in the models.

6.4 Maglione Format models

6.4.1 In early 2012, Mr Maglione started working for RTCM as Manager of business analysis and relocated to Mozambique[195]. Mr Maglione explains that his duties in this role included "*to build a financial model*" and that he built this model "*from scratch*"[196]. As I explain in paragraph 6.2.3 above, I refer to the iterations of the model developed by Mr Maglione as the Maglione Format models.

6.4.2 Mr Morris, to whom Mr Maglione reported, explains that the Maglione Format model was created, rather than using the Acquisition Format model, because "*the model that would be used for an acquisition, for this acquisition, would not be expected to be as detailed as a model that would be used over the long-term for an asset, or a suite of assets like RTCM. You do not have access to the same level of information during acquisition process, and it is not meant to be as detailed as something that we would be looking to produce*"[197].

6.4.3 Mr Maglione explains that the Maglione Format Model was, in his opinion, "*at a stage where it could be used probably around…March or April of 2012*"[198]. However, he also explains that the "*architecture for that model developed until probably September of 2012*"[199].

[193] The "*Summary*" worksheet incorporated an option as to whether Tete East should be included in the total computed value in these Key Models. Rio Tinto had selected "*No*" meaning that the computed value of Tete East was not included in the total computed value in the "*Summary*" worksheet
[194] RTCM Q1 2012 Forecast Presentation, page 16 [RT_00332119 to RT_00332140]
[195] Mr Maglione deposition transcript, dated 11 October 2019, page 21
[196] Mr Maglione deposition transcript, dated 11 October 2019, pages 26 and 27
[197] Mr Morris deposition transcript, dated 8 November 2018, page 38
[198] Mr Maglione deposition transcript, dated 11 October 2019, page 35
[199] Mr Maglione deposition transcript, dated 11 October 2019, page 30

6.4.4 Mr Maglione also explains that he ensured he had the best available information for inputs into the model and that this information was obtained from the relevant subject matter experts within RTCM[200].

May 2012 Brisbane Model[201]

6.4.5 On 11 May 2012, at a meeting in Brisbane, a presentation was provided to Mr Albanese and others relating to RTCM[202]. I have identified the final presentation which was presented at this meeting (the "**Final May 2012 Brisbane Presentation**")[203]. The Final May 2012 Brisbane Presentation included a number of slides which referred to a valuation of RTCM (including sensitivity analysis and the computed FCF), but it did not specifically state the NPV.

6.4.6 An earlier version of this presentation (the "**Draft May 2012 Brisbane Presentation**")[204] did state "*NPV = $(0.68)B*" (the brackets in this regard refer to a negative valuation). An email from Matt Coulter, Chief Development Officer, RTE ("**Mr Coulter**") to Christopher Carter, General Manager – Strategic Production Planning, TI ("**Mr Carter**"), dated 13 July 2012, explains that the Draft May 2012 Brisbane Presentation was "*prepared and presented to* [Mr Albanese], *although the NPV slide (slide 24) was presented in a more stylized form*"[205].

6.4.7 I have identified a Maglione Format model which corresponds to the "*US$(0.68)B*" valuation (the "**May 2012 Brisbane Model**")[206]. In the May 2012 Brisbane Model:

(a) the computed NPV (100% Share) is -US$684 million, reflecting the value set out in the Draft May 2012 Brisbane Presentation; and

(b) the computed NPV (RT Share) is -US$987 million.

[200] Mr Maglione deposition transcript, dated 11 October 2019, page 76
[201] Mr Morris suggests that all of the Maglione Format models prior to the May 2012 model computed negative valuations. (Mr Morris deposition transcript, dated 8 November 2018, page 210)
[202] Final May 2012 Brisbane Presentation [RT_00278107 to RT_00278133]
[203] Final May 2012 Brisbane Presentation [RT_00278107 to RT_00278133]. An email from Mr Morris, dated 16 May 2012, subject "*RE: TA presentation*" explains that this version of the presentation was the one given on 11 May 2012 [RT_00278105 to RT_00278106]
[204] Draft May 2012 Brisbane Presentation, page 24 [RT_00351366 to RT_00351417]
[205] Email from Mr Coulter to Mr Carter, dated 13 July 2012, subject "*RTCM DD Review*" [RT_00351365]
[206] May 2012 Brisbane Model [RT_00494469]

6.4.8 The May 2012 Brisbane Model assumed (on a 100% Share basis):

(a) a slower rate of Ramp-up of production (compared with the Acquisition Model) but after the period of Ramp-up significantly greater production – annual ROM steady-state production from Benga, Zambeze, Tete East and Minjova of 16Mtpa, 32Mtpa, 31Mtpa and 42Mtpa respectively – therefore, total annual ROM steady-state production of 120Mtpa, compared with 72Mtpa assumed in the Acquisition Model. Of this, 61% was assumed to be produced by Tete East and Minjova; and

(b) almost all coal transported to the coast for export via a Greenfield Railway solution. This Greenfield Railway was forecast to require significant Capital Costs. Rio Tinto also assumed that the spare capacity on this Greenfield Railway could be sold, thereby generating an additional revenue stream for the RTCM Assets.

6.4.9 The table below compares the computed NPV (RT Share) in the May 2012 Brisbane Model with the computed NPV (RT Share) in the Acquisition Model:

Table 6D: The May 2012 Brisbane Model compared with the Acquisition Model (RT Share)

	Acquisition	**May 2012 Bris**
	US$'m	***US$'m***
Benga	1,143	561
Zambeze	1,575	379
Tete East	344	354
	3,063	***1,295***
ZAC	30	-
Minjova	-	816
Infrastructure enablers	-	(3,115)
Unallocated overheads	(16)	-
Outstanding option proceeds	64	-
Other, including tax adjustments	-	18
Total (excluding net debt / cash)	**3,140**	**(987)**
Net debt / cash	545	
Total (including net debt / cash)	**3,685**	

June 2012 5YP Model

6.4.10 As set out in Section 5.5, annually in July each Rio Tinto Product Group was required to present its Five Year Business Plan to the PRC. A presentation titled "*Rio Tinto Coal Mozambique – Five Year Business Plan 2012 – 2017*", dated June 2012, appears to be RTCM's June 2012 submission to the PRC (the "**RTCM June 2012 5YP**")[207]. It includes a central case estimate NPV (RT Share) of US$1.1 billion[208, 209].

6.4.11 I have identified a Maglione Format model with the file name "*RTCM BU (Committed&Probable&Possible) MM060612*"[210] which appears[211] to be RTCM's Five Year Business Plan for 2012 (the "**June 2012 5YP Model**")[212].

6.4.12 The June 2012 5YP Model adopted the same broad assumptions (on a 100% basis) as the May 2012 Brisbane Model, subject to small differences in the Ramp-up profile, therefore:

(a) a slower rate of Ramp-up of production (compared with the Acquisition Model) but after the period of Ramp-up significantly greater production – annual ROM steady-state production from Benga, Zambeze, Tete East and Minjova of 16Mtpa, 32Mtpa, 31Mtpa and 42Mtpa respectively – therefore, total annual ROM steady-state production of 120Mtpa, compared with 72Mtpa assumed in the Acquisition Model. Of this, 61% was assumed to be produced by Tete East and Minjova; and

(b) almost all coal transported to the coast for export via a Greenfield Railway solution. This Greenfield Railway was forecast to require significant Capital Costs. Rio Tinto

[207] RTCM June 2012 5YP [RT_00057553 to RT_00057574]
[208] RTCM June 2012 5YP, slide 14, "*Central*"-"*Possible*" value [RT_00057553 to RT_00057574]
[209] I note that the Central-Possible RTCM value in the RTE - Five Year Business Plan 2012 – 2017, dated July 2012 (the "**RTE July 2012 5YP**"), is US$3.5 billion. However, the RTE July 2012 5YP explains that the "*RTCM Possible Valuation remain based on acquisition value*". RTE July 2012 5YP, dated July 2012, slide 23 [RT_00184998 to RT_00185028]
[210] June 2012 5YP Model [RT_SEC_00294968]
[211] The NPV (RT Share) in this DCF model materially agrees to the "*Central*"-"*Possible*" value (RT Share) in the RTCM June 2012 5YP (subject to a US$12 million difference). The file name "*RTCM BU (Committed&Probable&Possible) MM060612*" is also consistent with the model being a central case estimate produced in June 2012
[212] I note that I have used the "*Possible*" case, which I consider to be a prudent approach. The RTCM June 2012 5YP explains that "*central case*" is based on Benga (phases 1 and 2), development of the Sena Railway, BPP and "*study costs*", which aligns with the "*Probable*" case and has a computed NPV of US$75 million (RTCM June 2012 5YP, slides 1 and 14 [RT_00057553 to RT_00057574]). Further, Mr Morris explains that the Possible case is the "*aspirational view*" (Mr Morris deposition transcript, dated 8 November 2018, pages 127 and 128)

also assumed that the spare capacity on this Greenfield Railway could be sold, thereby generating an additional revenue stream for the RTCM Assets.

6.4.13 The table below compares the computed NPV (RT Share) in the June 2012 5YP Model with the computed NPV (RT Share) in the Acquisition Model:

Table 6E: The June 2012 5YP Model compared with the Acquisition Model (RT Share)

	Acquisition	**Jun 2012 5YP**
	US$'m	***US$'m***
Benga	1,143	801
Zambeze	1,575	1,247
Tete East	344	472
	3,063	***2,520***
ZAC	30	-
Minjova	-	1,369
Infrastructure enablers	-	(3,141)
Unallocated overheads	(16)	-
Outstanding option proceeds	64	-
Other, including tax adjustments	-	365
Total (excluding net debt / cash)	**3,140**	**1,112**
Net debt / cash	555	
Total (including net debt / cash)	**3,685**	

July 2012 Reference Case Model

6.4.14 RTCM's Conceptual Growth Programme, dated September 2012[213], explains that "[s]*ince acquisition the RTCM growth programme has constructed three major scenarios*"[214]:

(a) "*Scenario 1 – September 2011: Large production with a fast ramp-up*" – "*Following the acquisition of Riversdale, a vision for RTCM was presented to the market. This confirmed that RTCM was to be a long-life and expandable tier one asset that would be operating for 60+ years. It was indicated that the business could deliver 25 mtpa of*

[213] Conceptual Growth Programme [RT_00325682 to RT_00325791]
[214] Conceptual Growth Programme, pages 13 and 14 [RT_00325682 to RT_00325791]

coking coal (c. 38 mtpa total product) to market by 2020. This was based on four open cut mines – with Tete East and Minjova being added to the portfolio. The coal chain solution was still predicated on using Sena-Beira initially before moving to a 20 mtpa barging system and finally augmenting capacity with a Greenfield rail system of 25+ mtpa in 2018";

(b) "*Scenario 2 – March 2012: Large production with as fast a ramp up as achievable*" – "*RTCM advanced its resource knowledge, assessed potential mining techniques to be used and grappled with the in-country logistical challenges to be faced in delivering Scenario 1. Based on increased knowledge and understanding it was deemed necessary to slow the ramp up profile in the initial years – primarily driven by the size of the HME fleet and associated workforce that would be required in such a short space of time.*

A refined target was set for 21 mtpa of total product to be delivered to market by 2020. This was to be initially delivered with barges and then, to optimise transport unit costs, through a 75 mtpa Greenfield rail/ port system that would bring c. 50 mtpa of product to market. Optimisation of the RTCM business strategy was possible for the first time with the finalisation of the RTCM system valuation model. Whilst yielding improvement, a negative value outcome was realised"; and

(c) "*Scenario 3 – July: Timely delivery of four large-scale operations*" – "*Alternative sizing, funding options, operation design and value enhancement opportunities were assessed with a view to improving the system value. Following this wholesale review and challenge of the portfolio an NPV positive scenario was created*". Scenario 3 is referred to as the current "*Reference Case*" in the Conceptual Growth Programme.

6.4.15 Further, the Conceptual Growth Programme explains that:

"*The current Reference Case configuration is built around four mines (Benga, Zambeze, Tete East and Minjova) delivering c. 18 mtpa of Hard Coking Coal and 22 mtpa of Thermal coal. The mines are scheduled to deliver first coal no earlier than required, thus deferring capex spend while retaining tenure. Product will be delivered to market initially through the Sena-*

Beira system before switching to a 50 mtpa Greenfield rail/ port system that will be built, owned and operated by RTCM in 2019"[215].

"*Under the current Reference Case, RTCM is projected to delivery* [sic.] *over $1,500m of free cash annually to Rio Tinto over a 60+ year timeframe. However, the current configuration does not yet have a compelling NPV proposition. Based on a capital investment of c. $19,800m (nominal, 100% share) the business will return an* NPV_9 *of $3,100m*"[216].

6.4.16 I have identified a model which appears to relate to "*Scenario 3*" above (the "**July 2012 Reference Case Model**")[217]. The July 2012 Reference Case Model, which is a Maglione Format model, uses a valuation date of 1 July 2012 and has a computed NPV (RT Share) of US$2.4 billion.

6.4.17 The July 2012 Reference Case Model assumed (on a 100% Share basis):

(a) a rate of Ramp-up consistent with the May 2012 Brisbane Model (that is, a slower rate compared with the Acquisition Model). After the period of Ramp-up, the model assumed annual ROM steady-state production from Benga, Zambeze, Tete East and Minjova of 16Mtpa, 32Mtpa, 21Mtpa and 42Mtpa respectively – therefore, total annual ROM steady-state production of 110Mtpa, compared with 72Mtpa assumed in the Acquisition Model. Of this, 57% was assumed to be produced by Tete East and Minjova; and

(b) almost all coal transported to the coast for export via a Greenfield Railway solution. This Greenfield Railway was forecast to require significant Capital Costs. Rio Tinto also assumed that the spare capacity on this Greenfield Railway could be sold, thereby generating an additional revenue stream for the RTCM Assets.

6.4.18 The table below compares the computed NPV (RT Share) in the July 2012 Reference Case Model with the computed NPV (RT Share) in the Acquisition Model:

[215] Conceptual Growth Programme, page 14 [RT_00325682 to RT_00325791]
[216] Conceptual Growth Programme, page 16 [RT_00325682 to RT_00325791]
[217] July 2012 Reference Case Model [RT_00482466]

Table 6F: The July 2012 Reference Case Model compared with the Acquisition Model (RT Share)

	Acquisition	Jul 2012 RC
	US$'m	***US$'m***
Benga	1,143	1,263
Zambeze	1,575	1,411
Tete East	344	931
	3,063	***3,605***
ZAC	30	-
Minjova	-	2,294
Infrastructure enablers	-	(3,792)
Unallocated overheads	(16)	-
Outstanding option proceeds	64	-
Other, including tax adjustments	-	247
Total (excluding net debt / cash)	**3,140**	**2,352**
Net debt / cash	555	
Total (including net debt / cash)	**3,685**	

6.4.19 Since the Conceptual Growth Programme does not specify NPVs for "*Scenario 1*" and "*Scenario 2*", I have not been able to determine whether any of the models I have identified relate to these scenarios. However, I note that "*Scenario 2*" yielded "*a negative value outcome*" in March 2012 and that this was an "*improvement*"[218] compared with "*Scenario 1*".

Q3 2012 AOP Model

6.4.20 I have also identified a model titled "*RTCM BU (REF CASE – PLAN A – AOP) (POSSIBLE CENTRAL)*"[219] which adopts a valuation date of 1 October 2012. The computed NPV (RT Share) in this model agrees to the "*Central-Possible*" value of RTCM included in RTE's PRC Presentation in November 2012, titled "*12Q3 2013 -2014*"[220]. As set out at paragraph 5.5.7(c) above, each Rio Tinto Product Group present their AOPs to the PRC in November each year.

[218] Conceptual Growth Programme, page 14 [RT_00325682 to RT_00325791]
[219] Q3 2012 AOP Model [RT_SEC_00295004]
[220] RTE's PRC Presentation, titled "*12Q3 2013-2014*", dated November 2012, slide 29 [RT_SEC_00137357 to RT_SEC_00137400]

Therefore, it appears that the model I have identified is RTCM's Quarterly AOP Model for Q3 2012 (the "**Q3 2012 AOP Model**").

6.4.21 The Q3 2012 AOP Model assumed (on a 100% Share basis):

(a) a quicker rate of Ramp-up than the May 2012 Brisbane Model (albeit, a slower rate compared with the Acquisition Model). After the period of Ramp-up, the model assumed annual ROM steady-state production from Benga, Zambeze, Tete East and Minjova of 16Mtpa, 32Mtpa, 8Mtpa and 42Mtpa respectively – therefore, total annual ROM steady-state production of 97Mtpa, compared with 72Mtpa assumed in the Acquisition Model. Of this, 51% was assumed to be produced by Tete East and Minjova; and

(b) almost all coal transported to the coast for export via a Greenfield Railway solution. This Greenfield Railway was forecast to require significant Capital Costs. Rio Tinto also assumed that the spare capacity on this Greenfield Railway could be sold, thereby generating an additional revenue stream for the RTCM Assets.

6.4.22 The table below compares the computed NPV (RT Share) in the Q3 2012 AOP Model with the computed NPV (RT Share) in the Acquisition Model:

Table 6G: The Q3 2012 AOP Model compared with the Acquisition Model (RT Share)

	Acquisition	Q3 2012 AOP
	US$'m	***US$'m***
Benga	1,143	1,035
Zambeze	1,575	2,260
Tete East	344	9
	3,063	***3,305***
ZAC	30	-
Minjova	-	2,337
Infrastructure enablers	-	(2,827)
Unallocated overheads	(16)	-
Outstanding option proceeds	64	-
Other, including tax adjustments	-	516
Total (excluding net debt / cash)	**3,140**	**3,331**
Net debt / cash	545	
Total (including net debt / cash)	**3,685**	

The Impairment Models

6.4.23 Rio Tinto undertook two impairment tests in relation to the RTCM Assets (in November 2012 and January 2013). I have identified the models which correspond to these impairment tests, both of which are a Maglione Format model:

(a) the model which relates to the November 2012 impairment test (the "**November 2012 Impairment Model**") uses a valuation date of 1 November 2012 and has a computed NPV (RT Share) of US$4.3 billion[221]. The November 2012 Impairment Model was prepared assuming a similar scenario to the Q3 2012 AOP Model, subject to small differences in the coal chain. The November 2012 Impairment Model assumed:

(i) a quicker rate of Ramp-up than the May 2012 Brisbane Model (albeit, a slower rate compared with the Acquisition Model). After the period of Ramp-up, annual ROM steady-state production from Benga, Zambeze, Tete East and Minjova of

[221] November 2012 Impairment Model [RT_00494497]

16Mtpa, 32Mtpa, 8Mtpa and 42Mtpa respectively – therefore, total annual ROM steady-state production of 97Mtpa, compared with 72Mtpa assumed in the Acquisition Model. Of this, 51% was assumed to be produced by Tete East and Minjova; and

(ii) almost all coal transported to the coast for export via a Greenfield Railway solution. This Greenfield Railway was forecast to require significant Capital Costs. Rio Tinto also assumed that the spare capacity on this Greenfield Railway could be sold, thereby generating an additional revenue stream for the RTCM Assets. A small amount of production was also assumed to be transported via road train.

(b) the model which relates to the January 2013 Impairment test (the "**January 2013 Impairment Model**") uses a valuation date of 25 December 2012 and has a computed NPV (RT Share) of US$0.6 billion[222]. The January 2013 Impairment Model assumed (on a 100% Share basis) a Ramp-up of production to 2018 after which annual ROM steady-state production from Benga and Zambeze would be 11Mtpa and 20Mtpa respectively. It also assumed that almost all coal would be transported to the coast for export via the Sena Railway.

6.4.24 The table below summarises the computed NPV (RT Share) in the November 2012 Impairment Model and the January 2013 Impairment Model and compares them with the computed NPV (RT Share) in the Acquisition Model:

[222] January 2013 Impairment Model [RT_00234820]

Table 6H: The November 2012 Impairment Model and the January 2013 Impairment Model compared with the Acquisition Model (RT Share)

	Acquisition	**Nov 2012 Imp**	**Jan 2013 Imp**
	US$'m	***US$'m***	***US$'m***
Benga	1,143	1,109	377
Zambeze	1,575	2,854	597
Tete East	344	83	-
	3,063	***4,046***	***974***
ZAC	30	-	-
Minjova	-	1,792	-
Infrastructure enablers	-	(2,012)	(431)
Unallocated overheads	(16)	-	-
Outstanding option proceeds	64	-	-
Other, including tax adjustments	-	512	90
Total (excluding net debt / cash)	**3,140**	**4,338**	**632**
Net debt / cash	555		
Total (including net debt / cash)	**3,685**		

6.4.25 It is apparent from Table 6H that the computed NPV (RT Share) of the RTCM Assets in the January 2013 Impairment Model was US$632 million. However, the January 2013 Impairment was based upon a FVLCS assessment of US$611 million[223]. The difference between the US$632 million (per the January 2013 Impairment Model) and the US$611 million (the January 2013 Impairment FVLCS assessment) is because:

(a) a probabilistic weighting of 75% was applied to the computed NPV of Zambeze in the January 2013 Impairment Model; and

(b) the January 2013 Impairment FVLCS assessment included a number of potential upsides and downsides.

6.4.26 The table below provides a reconciliation between the January 2013 Impairment Model and the January 2013 Impairment FVLCS assessment:

[223] January 2013 Impairment Paper [RT_00257820 to RT_00257836]

Table 6I: The January 2013 Impairment Model and the FVLCS[224]

	Jan 2013 Imp	Weighting	Basis of the FVLCS assessment
	US$'m		*US$'m*
Benga	377	100%	377
Zambeze	597	75%	448
Infrastructure enablers	(431)	100%	(431)
Tax adjustments	90	100%	90
Total in January 2013 Impairment Model	***632***		***484***
Potential upsides and downsides	1,216	See below	126
FVLCS			**611**
Composition of "Potential upsides and downsides"			
	Potential	*Probability*	***Risk Weighted***
Upsides			
Benga Boundary Coal Resource upside potential	*95*	*50%*	***48***
Coal Bed Methane	*250*	*25%*	***63***
Benga Power Plant	*160*	*25%*	***40***
Third Party Valuation for Non-Core Resources	*600*	*20%*	***120***
Coal Chain upside potential	*620*	*18%*	***112***
Downsides			
Loss of right to consolidate tax losses	*(124)*	*80%*	***(99)***
Loss of deductions for pre-operations	*(32)*	*60%*	***(19)***
Value leakage through ownership transfer	*(155)*	*50%*	***(78)***
Capital Gains Tax	*(198)*	*30%*	***(59)***
Potential upsides and downsides	***1,216***	***10%***	***126***

6.4.27 Therefore, having computed an NPV (RT Share) of US$632 million in the January 2013 Impairment Model, in accordance with paragraph 5.6.4(b) above, when assessing the FVLCS probabilistic weightings adjusted this amount to be US$611 million.

[224] January 2013 Impairment Model [RT_00234820] and January Impairment Paper, page 4 [RT_00257820 to RT_00257836]

6.4.28 The potential upside and downside probabilistic assumptions include[225]:

(a) "*Benga Boundary Coal Resource Upside Potential*" – which related to potential tonnage from Tete East and Minjova, as well as boundary coal located between the Benga and Vale leases;

(b) "*Coal Bed Methane*" – which was a proof of concept stage asset which could be developed into a stand-alone gas supplying asset;

(c) "*Benga Power Plant*" ("**BPP**") – which would offer the Benga operations the prospect of selling reject material to the BPP which would then produce power to supply to RTCM's entire operations and export power regionally. The BPP was not modelled in the smaller RTCM system assumed in the January 2013 Impairment Model;

(d) "*Third Party Valuation for Non-Core Resources*" – which related to the unscheduled portion of RTCM's December 2012 resource estimates and was based upon Anglo's potential acquisition in the Revuboe deposit, which adjoins the Benga tenement;

(e) "*Alternate Coal Chain Solution*" – which related to potential upside of negotiating a lower rail and port tariff with the Government of Mozambique ("**GoM**") and the probability that a regional consortium engages in the development of a Greenfield solution to reduce infrastructure costs;

(f) "*Loss of right to consolidate tax losses*" – which were included to reflect that given the size, timing differences and complexity of RTCM, some tax-inefficiency, sterilisation of expenses , current losses and carry forward tax losses would occur;

(g) "*Loss of deductions for pre-operations expenses*" – which reflected the risk that pre-operating expenses may be sterilised and not be used as carry forward tax losses;

(h) "*Value leakage through change in Government of Mozambique Ownership*" – which reflected that the Rio Tinto were modelling 5% participation of the GoM, but there was a possibility this could be increased up to 25%, diluting RTCM's interest; and

[225] January 2013 Impairment Paper, pages 14 to 16 [RT_00257820 to RT_00257836]

(i) "*Capital Gains Tax*" – which reflected probabilistic downside exposure on the capital gains tax claim by the GoM.

6.5 Group Valuation Format models

6.5.1 As I explain in paragraph 6.2.3 above, the Group Valuation Format models included DCF models of the other CGUs in Rio Tinto Energy, as well as RTCM. I have identified nine Group Valuation Format models, two of which are duplicates.

6.5.2 The seven individual models I have identified are:

(a) a model titled "*RTE Group Valuation - Oct11 PEG - 27-10-11*" (the "**Oct 2011 Group Model**")[226];

(b) a model titled "*RTE Group Valuation - Oct11 PEG - Jan 12*" (the "**Jan 2012 Group Model 1**")[227];

(c) a model which was last modified on 30 January 2012 (the "**Jan 2012 Group Model 2**")[228];

(d) a model which agrees to the RTCM NPV in the RTE Group Valuation presentation dated 24 February 2012[229] (the "**Feb 2012 Group Model 1**")[230];

(e) a model which was last modified on 23 February 2012 (the "**Feb 2012 Group Model 2**")[231];

(f) a model titled "*RTE Group Valuation - May 2012 Submission*" (the "**May 2012 Group Model**")[232]; and

[226] Oct 2011 Group Model [RT_00466318]
[227] Jan 2012 Group Model 1 [RT_00478233]
[228] Jan 2012 Group Model 2 [RT_00337764]
[229] RTE Group Valuation Presentation [RT_00135251 to RT_00135255]
[230] Feb 2012 Group Model 1 [RT_00135256]
[231] Feb 2012 Group Model 2 [RT_00135191]
[232] May 2012 Group Model [RT_00184487]

(g) a model titled "*RTE Group Valuation - 2012-08-20 - Aug12 PEG as of 2013 - RTCM Excluded*" which does not include a valuation for RTCM (the "**Aug 2012 Group Model**"[233]).

6.5.3 In relation to (f) and (g):

(a) the RTCM valuation in the May 2012 Group Model is described in an email from Simon Riebensahm, Specialist Commercial Analyst – Strategy and Finance, RTE ("**Mr Riebensahm**") to Deep Chana, Business Development, RTHQ ("**Mr Chana**") dated 16 May 2012[234] as "*does **not** represent a new Central Case but still partially relies on acquisition assumptions, leaving the current valuation exposed to downside risk*" [emphasis added]; and

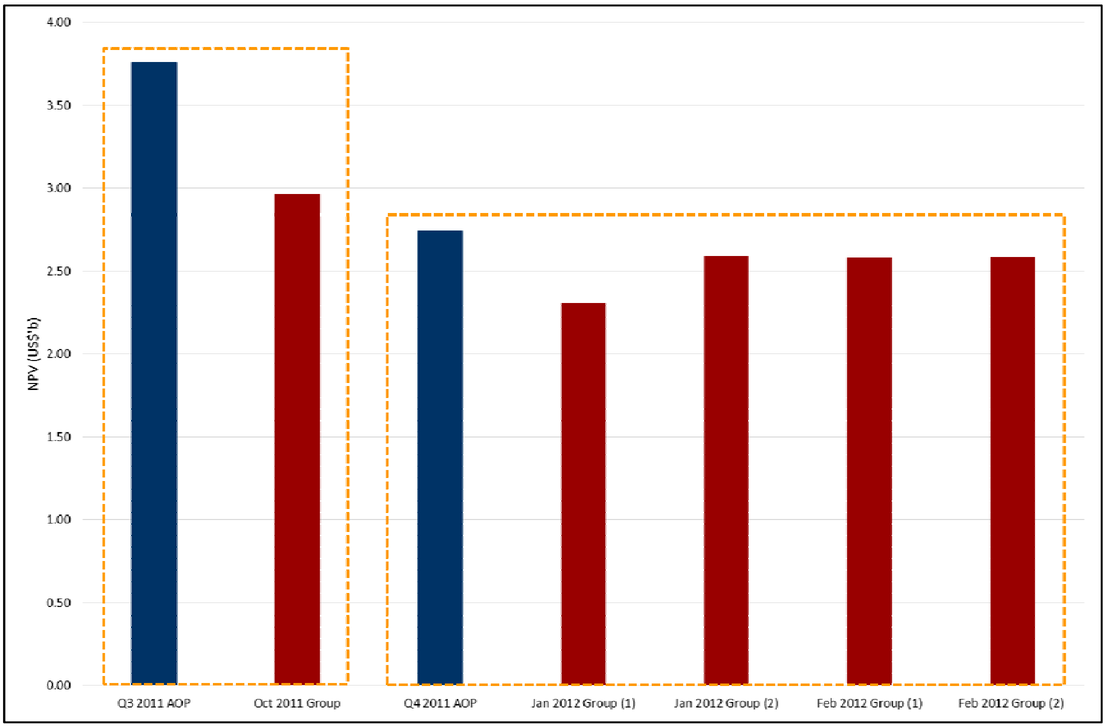
(b) an email from Mr Riebensahm to Mr Chana dated 20 August 2012[235] explains that a valuation for RTCM is not included in the Aug 2012 Group Model because "*no new central case could be confirmed*".

6.5.4 Both the May 2012 Group Model and Aug 2012 Group Model therefore do not appear to represent a CECF for RTCM.

6.5.5 In relation to the other Group Valuation Format models, I have compared the Group Valuation Format models dated between October 2011 and February 2012 with the AOP Models for Q3 2011 and Q4 2011:

[233] Aug 2012 Group Model [RT_00185960]
[234] Email from Mr Riebensahm to Mr Chana, dated 16 May 2012, subject "*RTE Group Valuation – May 2012 Submission*" [RT_00184480]
[235] Email from Mr Riebensahm to Mr Chana, dated 20 August 2012, subject "*RTE August Group Valuation Submission – RTCM excluded*" [RT_00185959]

Figure 6F: NPV computed in the Group Valuation Format models and the AOP Models (RT Share)[236]



6.5.6 Since the Oct 2011 Group Model computes a lower comparative NPV than the Q3 2011 AOP Model, and the other Group Valuation Format models compute lower comparative NPVs than the Q4 2011 AOP Model, I have not included the Group Valuation Format models in the Key Models.

6.6 The computed values in the Key Models

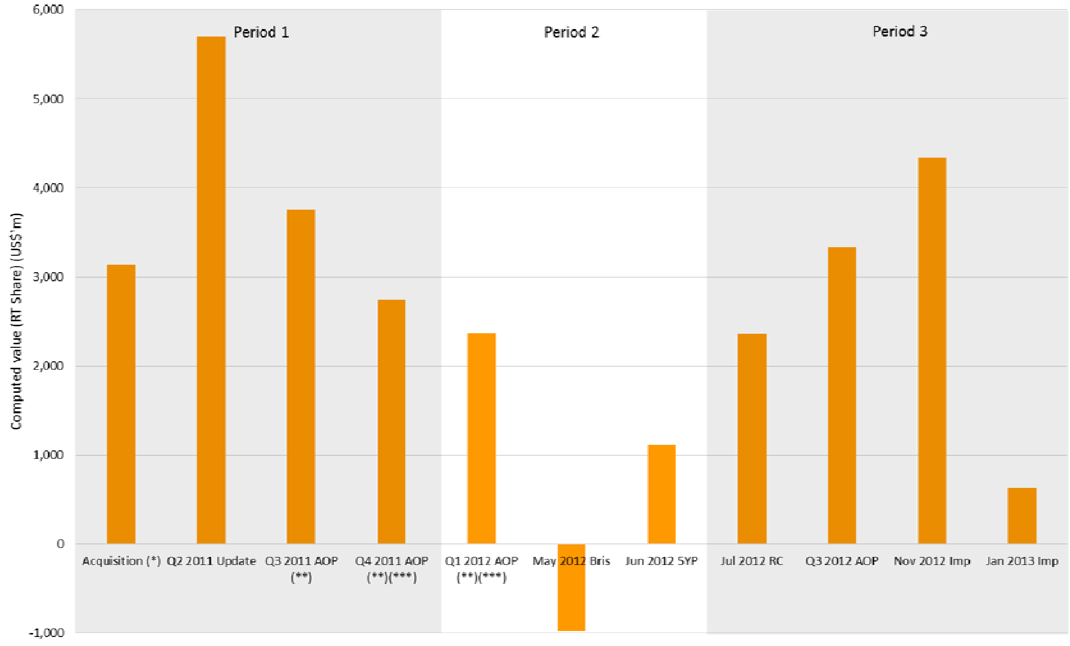
6.6.1 In Sections 6.3 to 6.5 above, I identified eleven Key Models which will be the focus of the remainder of my report[237].

6.6.2 The graph below summarises the computed NPV (RT Share) in each of the Key Models:

[236] I have excluded cash, Tete East and Minjova from the Group Valuation Format models to enable a "like-for-like" comparison with the AOP models

[237] Specifically, the Acquisition Model, the Q2 2011 Update Model, the Q3 2011 AOP Model, the Q4 2011 AOP Model, the Q1 2012 AOP Model, the May 2012 Brisbane Model, the June 5YP Model, the July 2012 Reference Case Model, the Q3 2012 AOP Model, the November 2012 Impairment Model and the January 2013 Impairment Model. In **Appendix E** I summarise the principal assumptions in the Key Models

Figure 6G: The computed NPV in the Key Models (RT Share)



* Includes the value attributed to WISCO
** Whilst there is a Tete East ("*EL9451*") worksheet in these Key Models which computes a value for Tete East, Tete East is excluded in the "*Summary*" worksheet in these Key Models
*** Whilst there is a "*Minjova*" worksheet in these Key Models which computes a value for Minjova, Minjova is not included in the "*Summary*" worksheet in these Key Models

6.6.3 It is evident from Figure 6G that:

(a) the Q4 2011 AOP Model to July 2012 Reference Case Model all have computed NPVs that are less than the NPV computed in the Acquisition Model;

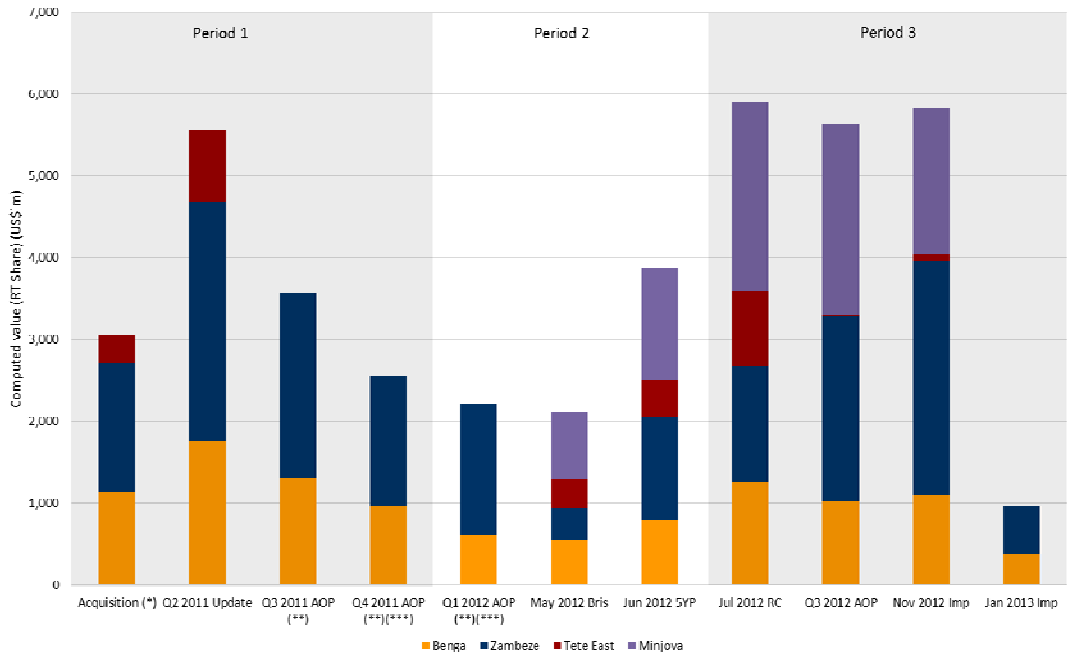
(b) the May 2012 Brisbane Model is significant because its computed NPV is negative;

(c) following the May 2012 Brisbane Model, the computed NPVs increase in each Key Model until the November 2012 Impairment Model. However, as I explain in Sections 7 to 12 below, these models were clearly not central case estimates; and

(d) the computed NPV in the January 2013 Impairment Model is significantly less than the computed NPV in the November 2012 Impairment Model.

6.6.4 Further, the graph below summarises the computed NPV (RT Share) of **only** Benga, Zambeze, Tete East and Minjova in each of the Key Models. Therefore, this graph does not take into account value (or negative value) attributed to other elements, such as infrastructure enablers. For example, whilst in relation to the May 2012 Brisbane Model the graph shows tenements of US$2,110 million, the graph does not include the -US$3,115 million of Coal Chain and other enablers nor US$18 million of other value. The net of these result in a computed value of -US$987 million in the May 2012 Brisbane Model (as shown in Figure 6G above).

Figure 6H: The computed NPV of only Benga, Zambeze, Tete East and Minjova in the Key Models (RT Share)



* Includes the value attributed to WISCO
** Whilst there is a Tete East ("*EL945L*") worksheet in these Key Models which computes a value for Tete East, Tete East is excluded in the "*Summary*" worksheet in these Key Models
*** Whilst there is a "*Minjova*" worksheet in these Key Models which computes a value for Minjova, Minjova is not included in the "*Summary*" worksheet in these Key Models

6.6.5 It is evident from Figure 6H that:

(a) the total computed NPVs of the tenements in the May 2012 Brisbane Model are less than the total computed NPV of the tenements in the Acquisition Model. Further, the computed NPVs of Benga and Zambeze (being the tenements that were at more advanced project stages) in the May 2012 Brisbane Model have decreased significantly but have been in part offset by the inclusion of Minjova (being one of the tenements that was at a less advanced project stage and therefore subject to greater uncertainty); and

(b) the NPVs of Benga and Zambeze computed in the May 2012 Brisbane Model are broadly consistent with the NPVs of these tenements in the January 2013 Impairment Model.

7 The factors which impacted the computed NPV of the RTCM Assets

7.1 Introduction

7.1.1 As I identify in Section 6 above, whilst in the Acquisition Model the computed NPV (RT Share) of the RTCM Assets was US$3.1 billion, in the January 2013 Impairment Model the computed NPV (RT Share) had decreased to US$632 million.

7.1.2 In this Section, I identify the principal factors which led to this decrease in computed NPV and / or otherwise impacted the NPV of the RTCM Assets in the Post Transaction Period (**Section 7.3**). I first explain my methodology for analysing the Key Models (**Section 7.2**).

7.2 The Drewe Model

7.2.1 For ease of analysis of the Key Models, I have produced my own Excel model (the "**Drewe Model**"). The Drewe Model is attached as **Appendix F** to my report.

7.2.2 The Drewe Model incorporates and reconciles all of the Key Models, therefore enabling me to identify differences in assumptions between the Key Models and quantify the impact of the differences in assumptions between the Key Models.

7.2.3 In producing the Drewe Model, I have reviewed in detail all the Key Models and in doing so I have identified a small number of errors (for example, where calculations have been based upon the wrong set of data in the input sheet) or inconsistencies. These errors have a negligible impact upon the computed NPV[238].

7.3 Overview of the principal factors which led to the decrease in the computed NPV of the RTCM Assets

7.3.1 Using the Drewe Model, I have identified that there are ten key factors which led to the decrease in computed NPV and / or otherwise impacted the NPV of the RTCM Assets in the Post Transaction Period. These factors fall into five areas, as follows:

[238] The Drewe Model, "*Findings*" worksheet/the Key Models

(a) RT Share, which comprises:

(i) the change in the RT Share of the tenements acquired in the Transaction; and

(ii) the extent to which Minjova should be included as part of the RTCM Assets;

(b) Economic assumptions, which comprise:

(i) long-term commodity pricing assumptions;

(ii) quality discounts and penalty assumptions; and

(iii) the applicable discount rate;

(c) Physical assumptions, which incorporate LOM production and annual production;

(d) Coal chain[239] assumptions, which comprise:

(i) the cost and profile of the Coal Chain; and

(ii) the sale of spare capacity; and

(e) Other cost assumptions, which comprise:

(i) Capital Costs (excluding transport related Capital Costs); and

(ii) Operating Costs (excluding transport related Operating Costs).

7.3.2 When considering these ten factors, I consider it helpful to divide the Post Transaction Period into three periods:

(a) "**Period 1**", being the period from acquisition to 31 December 2011 (being the reporting date of Rio Tinto's 2011 Annual Financial Statements);

(b) "**Period 2**", being the period from 1 January 2012 to 30 June 2012 (being the Relevant Period End); and

[239] "**Coal Chain**" refers to the logistics options for the transport of coal from the relevant mines to the coast for export

(c) "**Period 3**", being the period from 1 July 2012 to the January 2013 Impairment.

7.3.3 In Figure 7A below, I illustrate the impact of these ten factors on the computed NPV of the RTCM Assets[240]. In particular:

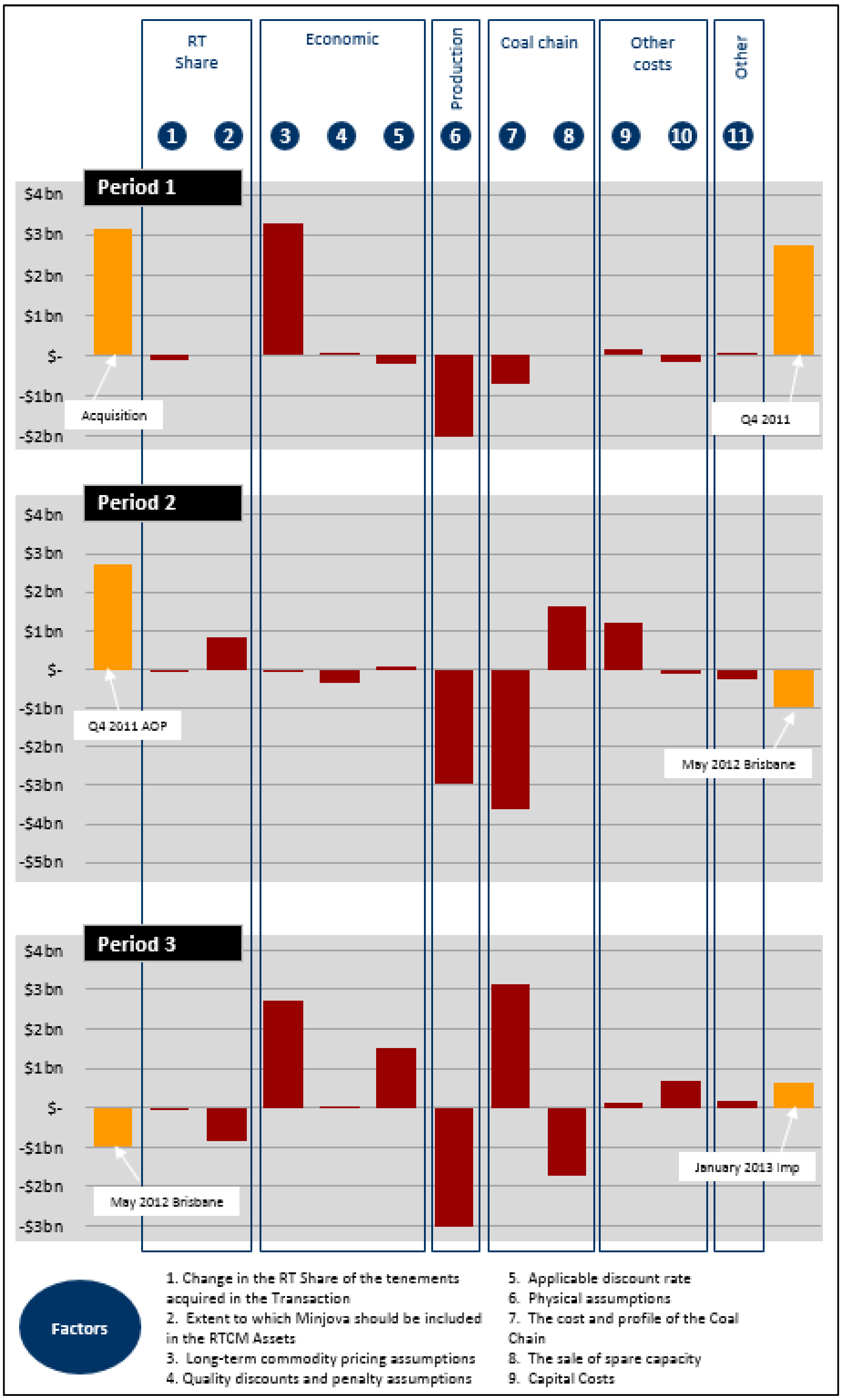
(a) the chart is divided into the three periods; Period 1, Period 2 and Period 3. Each of these periods is an area shaded grey;

(b) the orange bars represent the computed NPV (RT Share) at the beginning and at the end of each period; and

(c) the red bars represent the impact on the computed NPV of each of the ten factors – whether an increase or a decrease. These factors are plotted vertically on the chart so that the impact of that factor in each period can be compared.

[240] I have calculated the impact of the factors on the computed NPV in the order that the factors are set out in Figure 7A. This means that if the order in which these factors are addressed changes, there may be a difference in the quantum of the impact. The total impact will remain unaffected

Figure 7A: The principle factors which impacted the value of RTCM[241]



[241] Mazars' analysis

7.3.4 In Sections 8 to 12, I consider each of the ten factors in turn, including identifying the specific assumptions applied in each of the Key Models and assessing whether these assumptions were reasonable in the light of:

(a) Rio Tinto's contemporaneous valuation guidelines, including PEG (such as the requirement for a CECF);

(b) the requirements of a FVLCS assessment undertaken in accordance with IFRS and Rio Tinto's Controller's Manual; and

(c) the available contemporaneous evidence of the facts and circumstances that existed in the Post Transaction Period.

8 The assumptions relating to the RT Share

8.1 Introduction

8.1.1 In paragraph 6.2.6 above I explained the difference between 100% Share (being the total of the FCFs generated by the RTCM Assets, irrespective of the percentage owned by Rio Tinto and RT Share) and RT Share (being Rio Tinto's share of the FCFs generated by the RTCM Assets). It is the RT Share that is relevant for assessing the FVLCS of the RTCM Assets, and changes in the RT Share % applied can have a significant impact upon the assets' computed NPV.

8.1.2 In this Section, I identify the RT Share assumptions applied in the Key Models and I explain the impact of changes in these assumptions on the computed NPV. I also consider whether these assumptions appear reasonable in the light of:

(a) Rio Tinto's contemporaneous valuation guidelines, including PEG;

(b) the requirements of a FVLCS assessment undertaken in accordance with IFRS and Rio Tinto's Controller's Manual; and

(c) the available contemporaneous evidence of the facts and circumstances that existed in the Post Transaction Period.

8.1.3 Specifically:

(a) I first consider the change in the RT Share assumptions relating to the tenements acquired in the Transaction, being Benga, Zambeze and Tete East (**Section 8.2**). Whilst it is clear from my analysis that there were changes in the Key Models to these assumptions, I conclude that certain of the RT Share assumptions applied in each of the Key Models were reasonable; and

(b) I then consider the change in the RT Share assumptions relating to Minjova (**Section 8.3**). I conclude that, in certain of the Key Models, the RT Share assumptions were not reasonable nor consistent with a CECF because these models assumed an RT Share of more than 95% to 100% but (i) Rio Tinto's shareholding in Minjova was only 40% and (ii) Rio Tinto only had the right to acquire a total shareholding of 80% in

Minjova. Further, the total computed NPV of Minjova included in the Key Models (of between US$720 million and US$2.5 billion) does not appear reasonable in the light of (i) the purchase price Rio Tinto paid in 2011 for a 40% interest, being US$5 million, and (ii) this carrying value of US$5 million appears to have been impaired in December 2011.

8.2 The change in the RT Share assumptions relating to the tenements acquired in the Transaction (Benga, Zambeze and Tete East)

8.2.1 In this Section I consider the change in the RT Share assumptions relating to the tenements acquired in the Transaction, being Benga, Zambeze and Tete East:

(a) I first identify the RT Share assumptions applied in the Key Models (paragraphs 8.2.2 to 8.2.4); and

(b) I then assess the reasonableness of these assumptions (paragraphs 8.2.5 to 8.2.12).

The RT Share assumptions applied in the Key Models

8.2.2 In the Acquisition Model, Rio Tinto assumed[242]:

(a) an RT Share of Benga of 65%, on the basis that Benga was a joint venture between RTCM (65%) and Tata Steel Limited ("**Tata Steel**") (35%)[243];

(b) an RT Share of Zambeze of 60%. Although by way of the Transaction RTCM purchased a 100% interest in Zambeze, Riversdale had signed a non-binding Memorandum of Understanding ("**MoU**"), dated 24 June 2010, with Wuhan Iron and Steel (Group) Corporation ("**WISCO**"). The MoU provided for WISCO's acquisition of 40% of Zambeze for US$800 million[244]; and

(c) an RT Share of Tete East of 100%.

[242] Acquisition Model [RT_00337763]
[243] Deloitte PPA Report, page 11 [RT_00180990 to RT_00181048]
[244] Deloitte PPA Report, page 12 [RT_00180990 to RT_00181048]

8.2.3 In the table below, I set out the RT Share of Benga, Zambeze and Tete East applied in each of the Key Models[245].

Table 8A: The RT Share applied in the Key Models[246]

	Benga	Zambeze	Tete East
Period 1			
Acquisition Model	65%	60%	100%
Q2 2011 Update Model	65%	100%	100%
Q3 2011 AOP Model	65%	100%	*
Q4 2011 AOP Model	65%	100%	*
Period 2			
Q1 2012 AOP Model	65%	100%	*
May 2012 Brisbane Model	60%	100%	100%
June 2012 5YP Model	60%	100%	100%
Period 3			
July 2012 Reference Case Model	62%	95%	95%
Q3 2012 AOP Model	62%	95%	95%
November 2012 Impairment Model	62%	95%	95%
January 2013 Impairment Model	62%	95%	-

* Whilst there is a Tete East ("*EL945L*") worksheet in these Key Models which computes a value for Tete East, Tete East is excluded in the "*Summary*" worksheet in these Key Models (see paragraph 6.3.19)

8.2.4 It is evident from Table 8A that there were two significant changes in the RT Share applied in the Key Models:

(a) an increase in the RT Share of Zambeze from 60% in the Acquisition Model to 100% in the Q2 2011 Update Model (the "**WISCO Assumption**"); and

(b) a decrease in the RT Share of all tenements (the "**Government Buy-In Assumption**"). This reduction is applied to Benga from the May 2012 Brisbane Model and to Zambeze and Tete East from the July 2012 Reference Case Model.

[245] The RT Share of Minjova is addressed in Section 8.3

[246] The Drewe Model/the Key Models

My assessment of the reasonableness of the RT Share assumptions applied in the Key Models

The WISCO Assumption[247]

8.2.5 The Q2 2011 Update Model was described in an email from Mr Foster to Mr Narayanasamy dated 26 March 2012, as being an update for "*PEG pricing assumptions* ***and the decision to retain Zambeze rather than continuing with the Riversdale strategy to sell down 40%***"[248] [emphasis added].

8.2.6 Further, in an internal memo titled "*Reconciliation – Riversdale vs. RTCM Reference Case*", dated 22 October 2012, it is explained that "*Rio Tinto did not pursue the* [WISCO] *agreement*"[249].

8.2.7 The WISCO Assumption in the Q2 2011 Update Model *et seq* therefore, appears to have reflected the requirements of PEG and Rio Tinto's best estimate.

Government Buy-In Assumption

8.2.8 An internal memo titled "*RE: Extent of RT's obligation to Government of Mozambique to offer equity participation in RTCM projects*", dated 21 March 2012, explains that the GoM had both contractual and statutory rights to participate in RTCM projects[250]. This memorandum further explains that:

(a) the "*Mega Projects Law*" was first circulated as a draft legislation in April 2010 and the final law became effective on 15 August 2011. The Mega Projects Law "*provides for a minimum of 5% up to a maximum of 20% participation by the State, "on commercial market terms"*" in mining projects;

[247] See paragraph 8.2.2(b)

[248] Email from Mr Foster to Mr Narayanasamy, dated 26 March 2012, subject "*Riversdale Models*" [RT_00337762]

[249] Internal memo, titled "*Reconciliation – Riversdale Acquisition vs. RTCM Reference Case*", dated 22 October 2012, page 3 [RT_00188352 to RT_00188357]

[250] Internal memo, titled "*RE: Extent of RT's obligation to Government of Mozambique to offer equity participation in RTCM projects*", dated 21 March 2012, page 1 [RT_00344666 to RT_00344667]

(b) under the "*Benga Mining Contract*", RT was obliged to offer the GoM up to 5% of Benga at fair market value. However, Benga is not subject to the Mega Projects Law as "*the Contract was signed prior to the legislation being enacted*"; and

(c) in relation to Zambeze, an agreement is "*still being finalised with the GoM*" which "*mirrors the 5% equity obligation in Benga*".

8.2.9 Therefore, I understand that from 15 August 2011 the GoM had the right to purchase a minimum of 5% of each of RTCM's mining projects.

8.2.10 The January 2013 Impairment Paper sets out that "*The Benga Mine has existing joint venture agreements between RTCM, Tata Steel and the Government of Mozambique. The equity ownership is split 62:33:5 respectively*" [251]. I do not know the date of this joint venture.

8.2.11 The January 2013 Impairment Paper also explains that "*For the base valuation it has been assumed that the GoM will take a 5% stake in all projects*"[252]. On the basis that the Mega Projects Law became effective from August 2011, it appears to be the case that the Government Buy-In Assumptions should have been reflected in the Key Models earlier than in the May 2012 Brisbane Model for Benga and July 2012 Reference Case Model.

8.2.12 Further, as identified in paragraph 6.4.28(h) above, in the FVLCS assessment underpinning the January 2013 Impairment, Rio Tinto included a downside to take into account "*Value leakage trough change in Government of Mozambique Ownership*". This downside was assessed at US$155 million at a 50% risk (therefore a net downside of US$78 million).

8.3 The change in the RT Share assumptions relating to Minjova

8.3.1 Minjova was not one of the coal projects acquired by way of the Rio Tinto's acquisition of RTCM and it therefore did not form part of the Acquisition Model. However, although it appears that Minjova was never formally transferred into the RTCM CGU[253], during the Post Transaction Period Minjova came to be included in Rio Tinto's assessment of the NPV of the RTCM Assets. The extent to which Minjova should have been be included as part of this assessment is the focus of this Section:

[251] January 2013 Impairment Paper, page 13 [RT_00257820 to RT_00257836]
[252] January 2013 Impairment Paper, page 13 [RT_00257820 to RT_00257836]
[253] See footnote 121

(a) I first summarise my understanding of the relevant background to Minjova (paragraphs 8.3.2 to 8.3.4);

(b) I then identify the computed NPV of Minjova in the Key Models (paragraphs 8.3.5 to 8.3.9);

(c) I then assess the reasonableness of the assumptions relating to Minjova in the Key Models (paragraphs 8.3.10 to 8.3.16). This includes assessing the reasonableness of the RT Share of Minjova assumed in the Key Models and the total computed NPV of Minjova; and

(d) finally, I comment upon the financial impact of Minjova being included in the Key Models on the computed value of the other tenements (paragraphs 8.3.17 to 8.3.21).

My understanding of the relevant background to Minjova

8.3.2 I understand from the available information that:

(a) in October 2005, Rio Minjova Mining and Exploration Limitada ("**RMME**"), a company incorporated under the laws of Mozambique, was granted mining licences for the exploration of coal, basic metals, gold and platinum for a period of 10 years in an area of Mozambique called Minjova[254];

(b) on 18 February 2011, Aquatic Holdings (Mauritius) Limited ("**Aquatic Holdings**") entered into an option agreement (the "**Minjova Option Agreement**") with the original shareholders of RMME, pursuant to which Aquatic Holdings was granted the exclusive right to carry out a sampling programme within Minjova[255];

(c) Aquatic Holdings was acquired by Rio Tinto and transferred to Rio Tinto International Holdings Limited ("**RTIH**")[256]; and

[254] Rio Tinto Exploration, Project Handover Report 2011, dated January 2011 (the "**Project Handover Report 2011**"), page 8 [RT_00486017 to RT_00486079]
[255] I have not identified a copy of the Option Agreement however it is referenced in the Shareholders Agreement
[256] Email chain between Nousrath Bhugeloo, Executive Director, ABAX ("**Mr Bhugeloo**"), Victoria Honan, Corporate Counsel, RT ("**Ms Honan**") and Naziah Auleear, Corporate Administrator, ABAX ("**Ms Auleear**"), dated 26 September 2011 to 3 November 2011, subject "*RE: URGENT: transfer of Aquatic Holdings Limited*" [RT_SEC_00055347 to RT_SEC_00055358]

(d) on 8 November 2011, the Minjova Option Agreement was executed (the "**Shareholders Agreement**")[257]. Rio Tinto paid the original shareholders consideration of US$5 million in total for 40% of the shares in Minjova.

8.3.3 Therefore, Rio Tinto held a 40% shareholding in Minjova which it had acquired for US$5 million in November 2011. Under the Shareholders Agreement, Rio Tinto then had the right to increase its shareholding if it made payments to fund the venture and further payments to the original shareholders[258], as follows:

(a) "*Stage 1 Equity Interest*": subject to providing funding of US$2 million and making payments to the original shareholders of US$10million, Rio Tinto had the right to increase its shareholding in Minjova to 60%[259]. This option would expire in February 2013; and

(b) "*Stage 2 Equity Interest*": subject to providing further funding of US$5 million and making further payments to the original shareholders of US$15million, Rio Tinto had the right to increase its shareholding in Minjova to 80%[260]. This option would expire in February 2015.

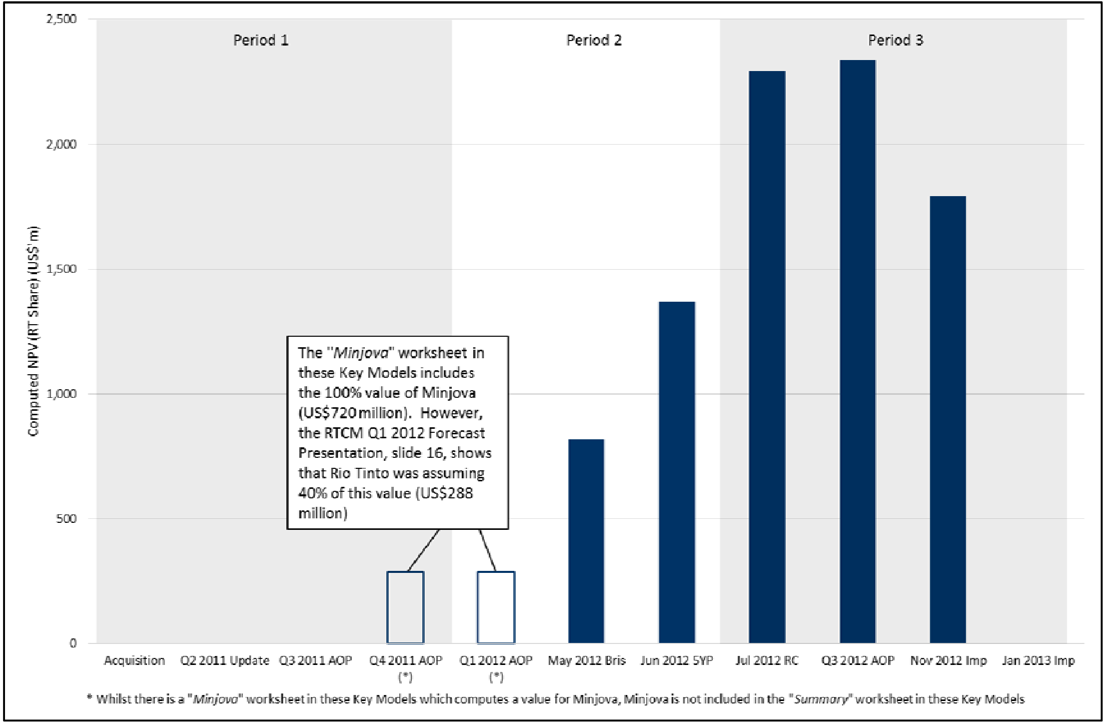
8.3.4 According to the RTCM Conceptual Growth Programme, Minjova was first included in the RTCM Reference Case in September 2011 when "*a vision for RTCM was presented to the market* […] *based on four open cut mines – with Tete East and Minjova being added to the portfolio*"[261].

The computed NPV of Minjova in the Key Models

8.3.5 The graph below summarises the computed NPV of Minjova (RT Share) in each of the Key Models:

[257] Shareholders Agreement, dated 8 November 2011, page 1
[258] Shareholders Agreement, dated 8 November 2011, page 1
[259] Shareholders Agreement, dated 8 November 2011, page 24, Section 9.1
[260] Shareholders Agreement, dated 8 November 2011, page 25, Section 9.2
[261] Conceptual Growth Programme, page 13 [RT_00325682 to RT_00325791]

Figure 8A: The computed value of Minjova in the Key Models (RT Share)[262]



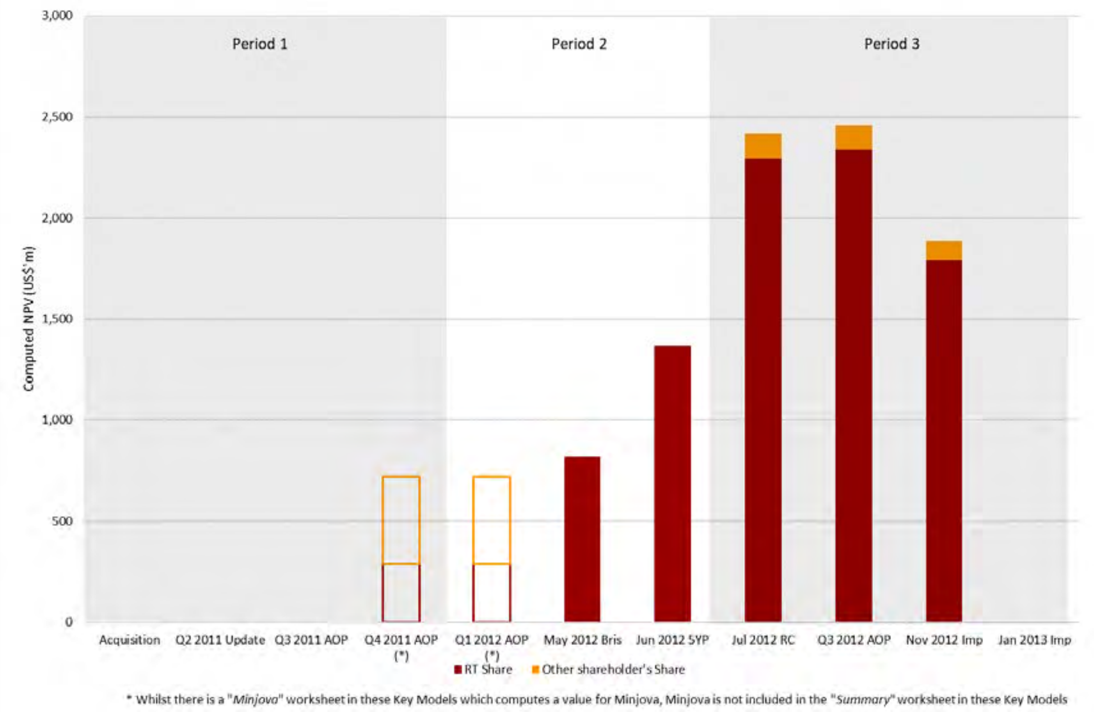
8.3.6 Figure 8A demonstrates that Minjova was not included in the summary values in the Key Models until the May 2012 Brisbane Model (in the Q4 2011 AOP Model and Q1 2012 AOP Model, there is a worksheet which computed an NPV for Minjova but this value is not included from the "*Summary*" worksheet - see paragraph 6.3.19). After the May 2012 Brisbane Model, there was a significant increase in the computed NPV of Minjova, to US$2.3 billion (RT Share) in the July 2012 Reference Case Model. In the January 2013 Impairment Model, the computed NPV of Minjova was nil.

8.3.7 These fluctuations in the computed NPV (RT Share) of Minjova are also reflected in Figure 7A above; the inclusion of Minjova increased the computed NPV of the RTCM Assets in Period 2 and then decreased the computed NPV in Period 3.

8.3.8 The graph below shows the total computed NPV of Minjova in each of the Key Models, including the split between RT Share and 100% Share:

[262] The Drewe Model/the Key Models

Figure 8B: The computed NPV of Minjova in the Key Models (RT Share and 100% Share)[263]



8.3.9 It is therefore evident that the increase in the computed NPV of Minjova (RT Share) in the Key Models was a function of an increase in:

(a) the RT Share of Minjova, from 40% (which was assumed in the Q4 2011 AOP Model to Q1 AOP 2012 Model, albeit the computed value was not included in the "*Summary*" worksheet in these Key Models) to 100% (which was assumed in the May 2012 Brisbane Model and the June 2015 5YP Model); and

(b) the total computed NPV of Minjova, from US$720 million (which was computed in the Q4 2011 AOP Model to Q1 2012 AOP Model, albeit this computed value was not included in the "*Summary*" worksheet in these Key Models) to US$816 million (which was computed in the May 2012 Brisbane Model) to US$2.4 billion and US$2.5 billion (which was computed in the July 2012 Reference Case Model and Q3 2012 AOP Model).

[263] The Drewe Model/the Key Models

My assessment of the reasonableness of the Minjova assessments in the Key Models

The RT Share of Minjova

8.3.10 Whilst Rio Tinto held a 40% shareholding, it had the right to increase its shareholding to 80%. However, it appears from the available documents that Rio Tinto did not increase its 40% shareholding in the Post Transaction Period. For example:

(a) a Rio Tinto document titled "*Project Understanding, Technical Risk Assessment and Action Planning*", dated 7 January 2013[264] explains:

"*Current Rio Tinto equity in the project is 40%, and will rise to 60% upon payment of the next option in 2013. The maximum equity that Rio Tinto can earn under the joint venture is 80%*"[265]; and

(b) with regard to the Stage 1 Equity Interest, a letter from Pedro Botte, Chief Financial Officer, RTCM ("**Mr Botte**") to the Original Shareholders (Mr Gerhard Ebenhaezer du Plessis and Mr Richard Wood), dated 21 January 2013[266], set out:

"[Rio Tinto] *hereby inform you that Aquatic Holdings Limited will not exercise the Stage 1 Equity Interest by 18 February 2013 as provided in the said Shareholders Agreement*".

8.3.11 The inclusion of a shareholding of more than 40% in the May 2012 Brisbane Model to the November 2012 Impairment Model is therefore inconsistent with the actual shareholding of Rio Tinto. Given Rio Tinto had the right to increase its shareholding to 80%, it may have been appropriate for Rio Tinto to include an RT Share of 80% if it was Rio Tinto's intention to exercise its options and increase its shareholding to 80% (and subject to the relevant cash outlays also being included in the DCF Model).

8.3.12 However, on the basis that Rio Tinto did not have the right to acquire a shareholding of more than 80%, it is logical to conclude that the computed NPVs could not have included a RT

[264] Project Understanding, Technical Risk Assessment and Action Planning, dated 7 January 2013 [RT_00346449 to RT_00346485]
[265] Project Understanding, Technical Risk Assessment and Action Planning, dated 7 January 2013, page 1 [RT_00346449 to RT_00346485]
[266] Letter from Mr Botte to the Original Shareholders, dated 21 January 2013 [RT_00249570]

Share in Minjova of more than 80%. As such, the RT Share of 100% assumed in the May 2012 Brisbane Model and June 2012 5YP Model, and the RT Share of 95% assumed in the July 2012 Reference Case Model, Q3 2012 AOP Model and November 2012 Impairment Model, is inconsistent with the concept of a CECF which requires "*upside potential*" (which the negotiation of a potential future purchase of the remaining 20% of Minjova may be deemed to be) to be considered by reference to sensitivity analysis, rather than factoring in the upside potential into the CECF. The table below summarises the impact on the computed NPV of the RTCM Assets in these models of applying an RT Share of Minjova of 80%:

Table 8B: The impact of adopting an RT Share in Minjova of 80%[267, 268]

Key Model	**Computed NPV of the RTCM Assets**	**Revised computed NPV of the RTCM Assets**	**Difference**
	US$'m	***US$'m***	***US$'m***
May 2012 Brisbane Model	(987)	(1,155)	(168)
June 2012 5YP Model	1,112	837	(275)
July 2012 Reference Case Model	2,352	1,988	(365)
Q3 2012 AOP Model	3,331	3,145	(186)
November 2012 Impairment Model	4,338	4,152	(186)

8.3.13 If a RT Share of 40% was adopted (being the actual RT Share of Minjova), the revised computed NPV would be less than the amounts in Table 8B.

The total computed NPV of Minjova

8.3.14 Whilst Rio Tinto was assuming that the total computed NPV of Minjova was between US$720 million and US$2.5 billion, these amounts do not appear reasonable in the context of a CECF given that[269]:

(a) Rio Tinto had acquired its 40% shareholding for US$5 million (implying a total value in the region of US$12.5 million); and

[267] Mazars' analysis
[268] In my report I have performed a number of sensitivity analyses to illustrate the broad impact of making certain adjustments to the assumptions in the Key Models. Importantly, these sensitivity analyses are undertaken on a standalone basis
[269] See paragraph 8.3.3

(b) Rio Tinto had the right to acquire further 20% shareholding for US$10 million and US$15 million (implying a total value in the region of US$50 million to US$75 million).

8.3.15 Moreover, the following available evidence suggests that at the end of 2011, Rio Tinto impaired its original US$5 million shareholding:

(a) RTCM's "*2012 Half Year Accounting Issues*" memorandum, dated 7 June 2012, explains that:

"*The investment of $5m in Minjova was impaired at Dec 11. Management are considering further investment into the vehicle in 2012 which indicate a reversal of the impairment, however as there is still uncertainty around the deal the impairment has not been reversed*"[270]; and

(b) an email from Brenda Cope, Director Group Accounting Policy & Advisory, RTHQ ("**Ms Cope**"), on 13 September 2012, explains that taking an additional 20% stake in Minjova may be "*a trigger to reverse the impairment*"[271]. In the same email chain, Renee Kevern, Principal Management Reporting and Analysis, RTHQ ("**Ms Kevern**"), stated that any additional stake in Minjova should be "*expensed as exploration expense* […] *as* ***<u>there is not currently any certainty around any future economic benefit that may arise from holding this license (i.e. whether there is any viable resource)</u>***" [emphasis added][272].

8.3.16 The impairment of Rio Tinto's investment in Minjova (via Aquatic Holdings) in December 2011 indicates that the investment was not expected by Rio Tinto to generate future value. It is difficult to reconcile how Rio Tinto's US$0.005 billion investment in Minjova in November 2011 which was impaired in December 2011 could be estimated to create US$2.3 billion of value for RTCM in July 2012 (an increase in value of 46,000% in six months).

[270] Internal memo, titled "*2012 Half Year Accounting Issues*", dated 7 June 2012, page 3 [RT_00096817 to RT_00096820]
[271] Email chain between Ms Cope, Tareq Sholi, Financial Controller, RTCM ("**Mr Sholi**") and Ms Kevern, subject "*RE: RTCM*", dated 13 September 2012 [RT_00350391 to RT_00350393]
[272] Email chain between Ms Cope, Mr Sholi and Ms Kevern, subject "*RE: RTCM*", dated 13 September 2012, [RT_00350391 to RT_00350393]

The impact of including Minjova in the Key Models on the computed value of the other tenements

8.3.17 Not only did Minjova contribute to the computed NPV in the May 2012 Brisbane Model to November 2012 Impairment Model, it also further contributed to the total value of the other RTCM Assets – this is because of Minjova's contribution to the expected cost of the Greenfield Railway. This is an important point when considering the value of the RTCM Assets in the Post Transaction Period and I therefore provide further explanation below.

8.3.18 In Section 11 below, I address the Coal Chain assumptions (the Coal Chain being the logistics options for the transport of coal from the relevant mines to the coast for export). In particular I identify that Rio Tinto had originally assumed that most of the saleable production would be transported via Barging down the Zambesi River (with the exception of a small amount of coal which would be transported via the Sena Railway) – this Barging option was considered to be the "*lower cost long term solution*"[273]. However, by May 2012 Rio Tinto's DCF models did not include barging as a Coal Chain solution (presumably due to its feasibility and its rejection by the Government Mozambique) and therefore Rio Tinto required another coal chain solution.

8.3.19 The Coal Chain solution then assumed by Rio Tinto was the construction of a Greenfield Railway (the requirement for a Greenfield Railway had been identified by Rio Tinto as early as September 2011, initially in addition to the Barging solution[274]). The Greenfield Railway had the benefit of being cost effective if there was sufficient volumes of saleable production to be able to justify its expense. As such, the significant volume of production assumed from Minjova as well as Tete East (in the May 2012 Brisbane Model, these tenements contributed 62%[275] of saleable production), together with an assumption that Rio Tinto would be able to sell any spare capacity at cost, enabled Rio Tinto to cover the significant cost of constructing the Greenfield Railway. Conversely, without the production from Minjova, Rio Tinto was not able to cover the significant cost of construction of the Greenfield Railway meaning that it would require an alternative, higher cost and lower volume Coal Chain solution.

[273] Rio Tinto Investment Committee Paper titled "*The Acquisition of Riversdale*", dated 18 November 2010, page 3 [RT_00283952 to RT_00283977]
[274] See Section 11.2
[275] RT Share

8.3.20 Further, the use of a higher cost and lower volume Coal Chain solution would have impacted the volume of saleable production Rio Tinto could assume from Benga and Zambeze. In particular, the long-term commodity price of Thermal Coal meant that it was not economically viable to export it using higher cost Coal Chain solutions. This issue was specifically identified by Rio Tinto in March / April 2012, for example:

(a) "***Without barging as an available transport route***, *many agricultural development opportunities will be unviable and development of the Moatize Basin could be reduced by half current projections as* ***thermal coal export mines are deemed unviable due to the higher transport costs***"[276] [emphasis added]; and

(b) "*Barging on River is materially cheaper to build and operate than port and rail, critical for development of thermal coal mines.* ***Without barging, the development of the Moatise Basin will be constrained by as much as half***. [...] *Thermal coal price = US$100/T and expected to decline over time; cannot afford to pay more than $30/T in transport to coast (mining $40/T+, shipping $x/T to Asia).* [...] *Barging cost = $25-30/T Vs greenfield port/rail >$40/T (Nacala >$55/T Source: UBS)*"[277] [emphasis added].

8.3.21 Therefore, when considering the impact of Minjova on the value of the RTCM Assets, it is important to not only consider the computed value of Minjova, but also its impact upon the computed value of the other tenements.

8.4 Conclusion on the RT Share assumptions applied in the Key Models

8.4.1 Considering the assumptions relating to RT Share in the light of (i) Rio Tinto's contemporaneous valuation guidelines; (ii) the requirements of a FVLCS assessment undertaken in accordance with IFRS and Rio Tinto's Controller's Manual; and (iii) the available contemporaneous evidence of the facts and circumstances that existed in the Post Transaction Period, my conclusions are as follows:

[276] Rio Tinto Coal Mozambique, Future Corridors Investment Proposal, dated February 2012, page 7 [RT_00026257 to RT_00026269]
[277] RTCM Key Messages & Communications Strategy - Infrastructure, dated March/April 2012, page 2 [RT_00041393 to RT_00041401]

(a) certain of the assumptions in the Key Models relating to RT Share of the tenements acquired in the Transaction appear reasonable; and

(b) the assumptions relating to Minjova in certain of the Key Models do not appear reasonable nor consistent with a CECF:

(i) the inclusion of an RT Share in Minjova of more than 80%[278], being the maximum shareholding Rio Tinto could acquire under the Shareholders Agreement; and

(ii) the inclusion of Minjova at a computed value which can only have reflected potential upside[279] when compared with the following:

- the purchase price Rio Tinto paid for a 40% interest, being US$5 million; and

- this carrying value of US$5 million of the purchased interest in Minjova appears to have been impaired at the end of December 2011.

8.4.2 Not only did Minjova contribute to the computed NPV in the May 2012 Brisbane Model to November 2012 Impairment Model, it also further contributed to the total value of the other RTCM Assets – this is because of Minjova's contribution to the expected cost of the Greenfield Railway.

[278] The Key Models which include an RT Share of more than 80% comprise the May 2012 Brisbane Model, the June 5YP Model, the July 2012 Reference Case Model, the Q3 2012 AOP Model and the November 2012 Impairment Model

[279] The Key Models which include Minjova at a computed value which can only have reflected potential upside comprise the May 2012 Brisbane Model, the June 5YP Model, the July 2012 Reference Case Model, the Q3 2012 AOP Model and the November 2012 Impairment Model

9 Economic assumptions

9.1 Introduction

9.1.1 In this Section I identify and consider the principal economic assumptions that impacted the computed NPVs in the Key Models. I also explain the impact of changes in these assumptions on the computed NPV and consider whether these economic assumptions appear reasonable in the light of:

(a) Rio Tinto's contemporaneous valuation guidelines, including PEG;

(b) the requirements of a FVLCS assessment undertaken in accordance with IFRS and Rio Tinto's Controller's Manual; and

(c) the available contemporaneous evidence of the facts and circumstances that existed in the Post Transaction Period.

9.1.2 The economic assumptions addressed in this Section comprise:

(a) long-term commodity pricing assumptions (**Section 9.2**). PEG required these pricing assumptions to be based upon PEG Updates[280] but I have identified that, whilst many of the Key Models broadly reflect the commodity pricing estimates included in the PEG Updates, there are certain exceptions (specifically, the May 2012 Brisbane Model and the July 2012 Reference Case Model). In relation to these two Key Models I calculate the impact on the computed NPV of adopting the then latest PEG Updates;

(b) quality discounts and penalty assumptions (**Section 9.3**). These discounts and penalties are deductions to the long-term commodity pricing estimates to reflect "*ash, calorific value, and the volume sold in any year*". The quality discounts and penalty assumptions assumed in most of the Key Models are consistent with the facts and circumstances that existed in the Post Transaction Period (according to the available contemporaneous information) and therefore do not appear to be unreasonable. In relation to Minjova in the November 2012 Impairment Model, Rio Tinto assumed a quality premium (rather

[280] See paragraph 4.6.5 *et seq*

than a discount), and I have not seen anything which explains why such a premium is appropriate; and

(c) the applicable discount rate (**Section 9.4**). The discount rate applied in a DCF model can have a significant impact upon the computed NPV[281] – the higher the discount rate, the lower the computed NPV. My analysis has identified that during the Post Transaction Period the discount rates applied by Rio Tinto in the Key Models changed. I conclude that I have not seen anything which suggests that the discount rates used in the Key Models were not reasonable. However, if a plan NPV was to be used as the basis for a FVLCS assessment, the discount rate would require adjusting so that it represented the discount rate of a market participant.

9.2 Long-term commodity pricing assumptions

9.2.1 As I explain in paragraph 4.6.5 *et seq* above, it was Rio Tinto's policy for Rio Tinto Economics & Markets to issue PEG Updates on a regular basis (either three or four times per annum). PEG Updates include[282]:

(a) Rio Tinto's latest long-term commodity pricing, in particular in relation to HCC and Thermal Coal;

(b) foreign exchange rates; and

(c) inflation.

9.2.2 In relation to the RTCM Assets, only long-term commodity pricing assumptions had a visible impact upon the computed NPV[283]. In this regard, it is evident from Figure 7A above that these increased the computed NPV of the RTCM Assets (RT Share) in Periods 1 and 3, but did not have a material impact in Period 2. In this Section I therefore consider the long-term commodity pricing assumptions in the Key Models:

281 See Section 4.4
282 See for example November 2010 PEG [RT_00338144]
283 Foreign exchange rates do not impact the Maglione Format models and in the Acquisition Format models foreign exchange rates only impacted Tete East, ZAC and overheads. Given the Key Models are all in real terms (as required by PEG), inflation is only relevant to the calculation of tax

(a) I first identify the long-term commodity pricing assumptions applied in the Key Models (paragraphs 9.2.3 to 9.2.7); and

(b) I then assess the reasonableness of these assumptions, in particular by comparing them with the facts and circumstances that existed in the Post Transaction Period (according to the available contemporaneous information) (paragraphs 9.2.8 to 9.2.18).

The long-term commodity pricing assumptions applied in the Key Models

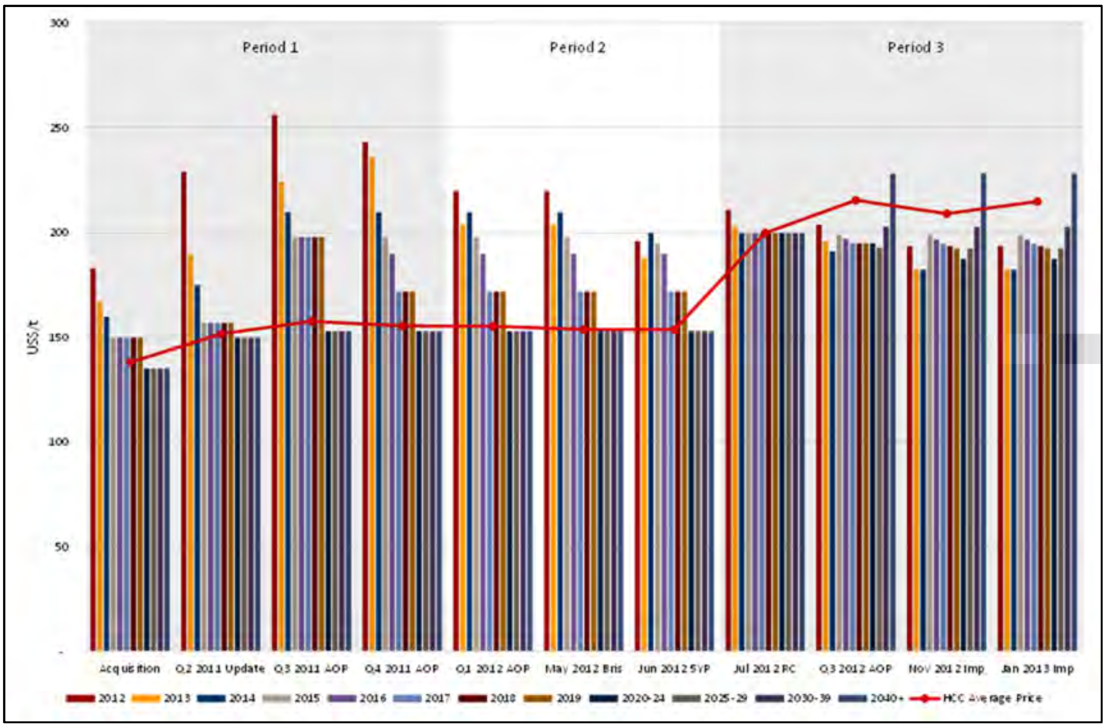
9.2.3 I consider HCC and Thermal Coal in turn:

HCC

9.2.4 The graph below sets out the evolution of the HCC prices in the Key Models for each year from 2012[284] to 2019, and then collectively for the periods 2020 to 2024, 2025 to 2029, 2030 to 2039, and then 2040 onwards. Also included in the graph is the weighted average selling price of HCC (for Benga and Zambeze) in each of the Key Models.

[284] I note that there were also forecast prices for 2010 and 2011 in the Key Models between the Acquisition Model and the Q1 2012 AOP Model

Figure 9A: Summary of HCC prices in the Key Models[285]



9.2.5 It is evident from Figure 9A that there was a small increase in HCC prices in Period 1. HCC prices then remained constant in Period 2 before a further increase in HCC prices in Period 3. The profile of the HCC prices in the July 2012 Reference Case Model appears, at face value, to be an anomaly.

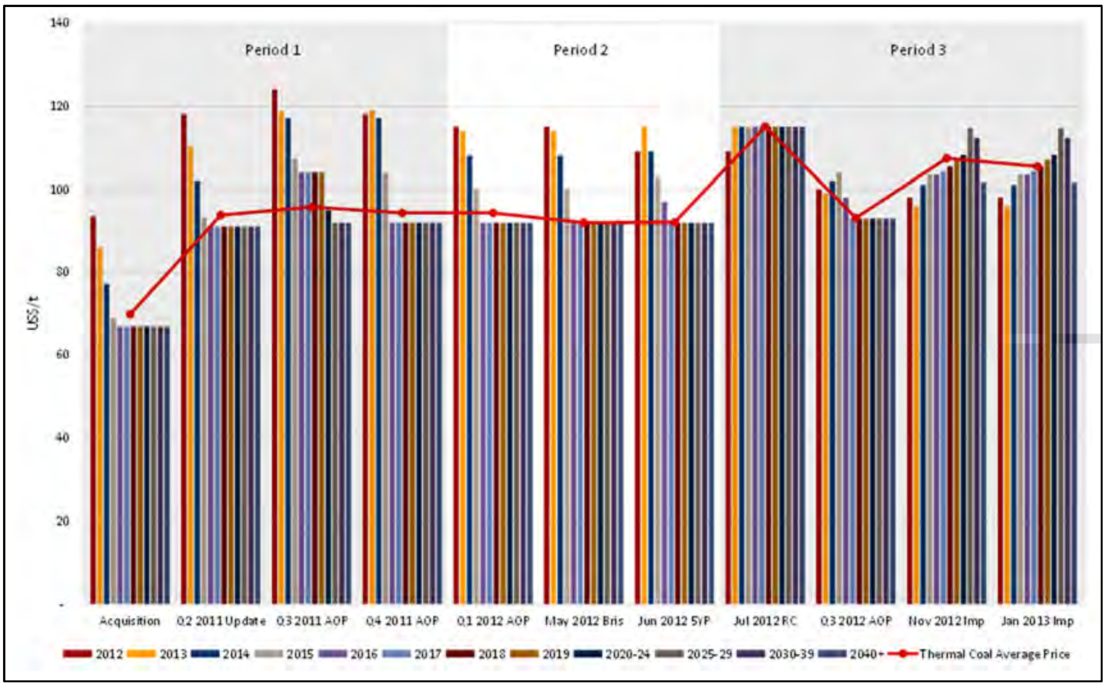
Thermal Coal

9.2.6 The graph below sets out the evolution of the Thermal Coal prices in the Key Models for each year from 2012[286] to 2019 and then collectively for the periods 2020 to 2024, 2025 to 2029, 2030 to 2039 and then 2040 onwards. Also included in the graph is the weighted average selling price of Thermal Coal (for Benga and Zambeze) in each of the Key Models.

[285] The Drewe Model/the Key Models

[286] I note that there were also forecast prices for 2010 and 2011 in the Key Models between the Acquisition Model and the Q1 2012 AOP Model

Figure 9B: Summary of Thermal Coal prices in Key Models[287]



9.2.7 It is evident from Figure 9B that there was an increase in Thermal Coal prices in Period 1 (and this increase was more significant than the Period 1 increase in HCC prices). Most of this increase was factored into the Key Models by the date of the Q2 2011 Update Model. In Period 2, there was a decline in the Thermal Coal prices. In Period 3, there was an increase in Thermal Coal prices. The increase and profile in the July 2012 Reference Case Model appears, at face value, to be an anomaly.

My assessment of the reasonableness of the long-term commodity pricing assumptions applied in the Key Models

9.2.8 Pursuant to PEG, the long-term commodity pricing assumptions in the Key Models should have changed as PEG Updates were issued. I have identified PEG Updates issued on the following dates:

(a) 22 November 2010 ("**November 2010 PEG**")[288];

[287] The Drewe Model/the Key Models
[288] November 2010 PEG [RT_00338144]

(b) 6 May 2011 ("**May 2011 PEG**")[289];

(c) 16 August 2011 ("**August 2011 PEG**")[290];

(d) 19 October 2011 ("**October 2011 PEG**")[291];

(e) 16 November 2011 ("**November 2011 PEG**")[292];

(f) 18 January 2012 ("**January 2012 PEG**")[293];

(g) 11 May 2012 ("**May 2012 PEG**")[294];

(h) 11 August 2012 ("**August 2012 PEG**")[295];

(i) 18 September 2012 ("**September 2012 PEG**")[296];

(j) 24 October 2012 ("**October 2012 PEG**")[297];

(k) 13 November 2012 ("**November 2012 PEG**")[298]; and

(l) 18 January 2013 ("**January 2013 PEG**")[299].

9.2.9 Although PEG suggests that PEG Updates are issued quarterly, the PEG Updates I have identified suggest that PEG Updates were issued on a more regular basis.

9.2.10 In **Appendix G**, I compare the long-term commodity pricing assumptions included in the Key Models with the commodity pricing assumptions included in the then-extant PEG Update. On the basis of **Appendix G**, I summarise in the table below the date of the PEG Updates applied in each of the Key Models:

[289] May 2011 PEG [RT_00338140][RT_00338140]
[290] August 2011 PEG [PwCUK000003751_0001 to PwCUK000003751_0007]
[291] October 2011 PEG [RT_00402881 to RT_00402887]
[292] November 2011 PEG [RT_00369205 to RT_00369211]
[293] January 2012 PEG [RT_00135223]
[294] May 2012 PEG [RT_00373357 to RT_00373362]
[295] August 2012 PEG [RT_00373700 to RT_00373705]
[296] September 2012 PEG [RT_SEC_00017883]
[297] October 2012 PEG [RT_00375326]
[298] November 2012 PEG [RT_00375294 to RT_00375299]
[299] January 2013 PEG [RT_SEC_00276915 to RT_SEC_00276920]

Table 9A: PEG Update applied in each Key Model

Key Model	PEG Update applied	Latest PEG Update
Period 1		
Acquisition Model	November 2010 PEG	November 2010 PEG
Q2 2011 Update Model	May 2011 PEG	May 2011 PEG
Q3 2011 AOP Model	August 2011 PEG	August 2011 PEG
Q4 2011 AOP Model	November 2011 PEG	November 2011 PEG
Period 2		
Q1 2012 AOP Model	January 2012 PEG[300]	January 2012 PEG
May 2012 Brisbane Model	January 2012 PEG[301]	May 2012 PEG
June 2012 5YP Model	May 2012 PEG	May 2012 PEG
Period 3		
July 2012 Reference Case Model	Unknown	May 2012 PEG
Q3 2012 AOP Model	October 2012 PEG	October 2012 PEG
November 2012 Impairment Model	November 2012 PEG[302]	November 2012 PEG
January 2013 Impairment Model	January 2013 PEG[303]	January 2013 PEG

9.2.11 As can be seen from Table 9A, the latest PEG Update has been applied to the majority of the Key Models (subject to very minor differences identified in **Appendix G**). However, for the May 2012 Brisbane Model and the July Reference Case Model the latest PEG Update was not applied.

May 2012 Brisbane Model

9.2.12 In the May 2012 Brisbane Model, the PEG Update applied was the January 2012 PEG. However, the latest PEG Update was the May 2012 PEG (albeit the May 2012 PEG Update is dated 11 May 2012, the same day as the Brisbane meeting).

[300] The Q1 2012 AOP Model, "*Assumptions*" worksheet suggests that February 2012 PEG prices are applied in this model. My analysis shows that the January 2012 PEG prices were applied in this model (I have not identified any February 2012 PEG Update) [RT_00337735]

[301] The May 2012 Brisbane Model, "*Global Inputs*" worksheet suggests that February 2012 PEG prices are applied in this model. My analysis shows that the January 2012 PEG prices were applied in this model (I have not identified any February 2012 PEG Update) [RT_00494469]

[302] The November 2012 Impairment Model, "*Global Inputs*" worksheet suggests that October 2012 PEG prices are applied in this model. My analysis shows that the November 2012 PEG prices were applied in this model [RT_00494497]

[303] The January 2013 Impairment Model, "*Global Inputs*" worksheet suggests that October 2012 PEG prices are applied in this model. My analysis shows that the January 2013 PEG prices were applied in this model [RT_00234820]

9.2.13 If the May 2012 Brisbane Model is updated to include the long-term commodity prices in the May 2012 PEG Update, this would reduce the computed NPV as follows:

Table 9B: Sensitivity analysis – May 2012 PEG in the May 2012 Brisbane Model[304]

	May 2012 Bris	Revised NPV	Impact of Sensitivity
	US$'m	*US$'m*	*US$'m*
Benga	561	555	(6)
Zambeze	379	379	-
Tete East	354	354	-
ZAC	-	-	-
Minjova	816	816	-
Infrastructure enablers	(3,115)	(3,115)	-
Other	18	15	(3)
Total (excluding net debt / cash)	***(987)***	***(996)***	***(9)***

July 2012 Reference Case Model

9.2.14 In the July 2012 Reference Case Model, HCC price forecasts were included at US$200/t and Thermal Coal price forecasts were included at US$115/t from 2013 onwards. These prices do not agree to any of the PEG Updates I have identified. Further, none of the PEG Updates I have identified have had a price profile which is flat over the whole period.

9.2.15 An email from Rob Russell-Smith, Principal valuations, RTHQ ("**Mr Russell-Smith**") to Mr Morris dated 2 July 2012 describes "*upside prices*" as "*$200/t for hard coking coal from 2025 onwards and $115/t for thermal coal from 2020 onwards*"[305]. Therefore, it would appear that the July 2012 Reference Case Model was applying upside prices. This is inconsistent with the requirements of PEG, for example that "*upside potential*" should be reflected in a sensitivity analysis, rather than in a CECF, which should neither be "*unduly optimistic nor pessimistic*".

[304] Mazars' analysis
[305] Email from Mr Russell-Smith to Mr Morris, dated 2 July 2012, subject "*RE: Met and thermal coal developing price views*" [RT_00346601 to RT_00346602]

9.2.16 A further email from Mr Russell-Smith, dated 7 August 2012, states that "*I thought I would forward you the draft coal prices which are likely to be approved at the ExCo meeting later this week (although please note these are still draft and so may be subject to change). I appreciate that the long-term prices of $110/t for hard coking coal and $185/t for thermal coal are slightly below the $115t and 200/t that we ran the numbers on for the purpose of the HY review so I was wondering whether you might be able to infer what impact these prices may have on the RTCM value ($5.1bn being the value that we documented albeit with all the caveats that we listed in the paper)*"[306].

9.2.17 In response to this email it was explained that "[r]*unning these numbers will result in a revised valuation of c. $2.6bn. I assume the consequences of this are fairly poor (from an impairment perspective). Given we have to submit our final ic paper a week on monday we need to understand quickly whether this is going to be an 'acceptable' valuation*"[307].

9.2.18 If the July 2012 Reference Case Model is updated to include the long-term commodity prices in the May 2012 PEG Update, this would reduce the computed NPV as follows:

Table 9C: Sensitivity analysis – May 2012 PEG in the July 2012 Reference Case Model[308]

	Jul 2012 RC	**Revised NPV**	**Impact of Sensitivity**
	US$'m	***US$'m***	***US$'m***
Benga	1,263	703	(560)
Zambeze	1,411	266	(1,144)
Tete East	931	180	(752)
ZAC	-	-	-
Minjova	2,294	1,130	(1,164)
Infrastructure enablers	(3,792)	(3,792)	-
Other	247	109	(138)
Total (excluding net debt / cash)	**2,353**	**(1,405)**	**(3,758)**

[306] Email chain between Mr Russell-Smith and Mr Morris, dated 7 August 2012, subject "*Thermal and met coal PEG prices*" [RT_00216267 to RT_00216269]
[307] Email chain between Mr Russell-Smith and Mr Morris, dated 7 August 2012, subject "*Thermal and met coal PEG prices*" [RT_00216267 to RT_00216269]
[308] Mazars' analysis

9.3 Quality discounts and penalty assumptions

9.3.1 The quality discounts and penalty assumptions are adjustments to the long-term commodity prices to reflect a discount for "*ash, calorific value, and the volume sold in any year*"[309]. Mr Dupree describes these penalties as "*penalties on coal contracts for impurities or other problems in a coal*"[310]. The discount is included in the Key Models as a percentage[311]. If, for example, the quality discount was 10%, the quality discount applied in the model would be 90%; this is because the net revenue after the quality discount is the product of the revenue pre discount and the quality discount.

9.3.2 In this Section I consider the quality discounts and penalty assumptions in the Key Models:

(a) I first identify the quality discounts and penalty assumptions applied in the Key Models (paragraphs 9.3.3 to 9.3.5); and

(b) I then assess the reasonableness of these assumptions (paragraphs 9.3.6 to 9.3.11).

The quality discounts and penalty assumptions applied in the Key Models

9.3.3 The quality discounts and penalty assumptions applied in each Key Model differ depending on the commodity (that is, HCC or Thermal Coal) and tenement (Benga, Zambeze, Tete East or Minjova).

9.3.4 In Tables 9D and 9E below I summarise the HCC and Thermal Coal quality discounts and penalty assumptions applied in each of the Key Models by tenement:

[309] Internal memo, titled "*Reconciliation – Riversdale Acquisition vs. RTCM Reference Case*", dated 22 October 2012 [RT_00188352 to RT_00188357]
[310] Mr Dupree deposition transcript, dated 20 February 2019 page 130
[311] Mr Maglione deposition transcript, dated 11 October 2019, page 120

Table 9D: Quality discounts and penalty assumptions for HCC applied in the Key Models[312]

Key Models	Benga	Zambeze	Tete East	Minjova
Period 1				
Acquisition Model	100%	92% to 100%	92% to 100%	n/a
Q2 2011 Update Model	100%	92% to 100%	92% to 100%	n/a
Q3 2011 AOP Model	100%	92% to 100%	*	n/a
Q4 2011 AOP Model	100%	92% to 100%	*	**
Period 2				
Q1 2012 AOP Model	85% to 99%	92% to 100%	*	**
May 2012 Brisbane Model	97.5%	92%	92%	97.5%
June 2012 5YP Model	97.5%	92%	92%	97.5%
Period 3				
July 2012 Reference Case Model	97.5%	87.5%	92%	97.5%
Q3 2012 AOP Model	97.5%	92%	92%	97.5%
November 2012 Impairment	97.5%	92%	92%	97.5%
January 2013 Impairment Model	97.5%	92%	n/a	n/a

* Whilst there is a Tete East ("*EL945L*") worksheet in these Key Models which computes a value for Tete East, Tete East is excluded in the "*Summary*" worksheet in these Key Models (see paragraph 6.3.19)

** Whilst there is a "*Minjova*" worksheet in these Key Models which computes a value for Minjova, Minjova is not included in the "*Summary*" worksheet in these Key Models (see paragraph 6.3.19)

[312] The Drewe Model/the Key Models

Table 9E: Quality discounts and penalty assumptions for Thermal Coal applied in the Key Models[313]

Key Models	Benga	Zambeze	Tete East	Minjova
Period 1				
Acquisition Model	64% to 76%	64% to 71%	65%	n/a
Q2 2011 Update Model	71% to 79%	71% to 76%	65%	n/a
Q3 2011 AOP Model	73% to 80%	73% to 78%	*	n/a
Q4 2011 AOP Model	73% to 80%	73% to 78%	*	**
Period 2				
Q1 2012 AOP Model	73% to 79%	73% to 77%	*	**
May 2012 Brisbane Model	75%	75%	75%	100%
June 2012 5YP Model	75%	75%	75%	100%
Period 3				
July 2012 Reference Case Model	75%	75%	75 to 76%	100%
Q3 2012 AOP Model	75%	75%	75 to 76%	100%
November 2012 Impairment	75%	75%	75 to 76%	110%
January 2013 Impairment Model	75%	75%	n/a	n/a

* Whilst there is a Tete East ("*EL945L*") worksheet in these Key Models which computes a value for Tete East, Tete East is excluded in the "*Summary*" worksheet in these Key Models (see paragraph 6.3.19)

** Whilst there is a "*Minjova*" worksheet in these Key Models which computes a value for Minjova, Minjova is not included in the "*Summary*" worksheet in these Key Models (see paragraph 6.3.19)

9.3.5 As can be seen in the tables above, for both HCC and Thermal Coal, the quality discounts and penalty assumptions at Benga, Zambeze and Tete East all broadly increased during the period (increasing the impact of the quality discounts). However, the quality discounts for Minjova Thermal Coal decreased (decreasing the impact of the quality discounts). The November 2012 Impairment Model included a discount of 110% in relation to Thermal Coal product produced by Minjova, meaning that Rio Tinto was assuming that the Thermal Coal would be sold at a premium to the long-term prices set out in the PEG Update.

[313] The Drewe Model/the Key Models

My assessment of the reasonableness of the quality discounts and penalty assumptions applied in the Key Models

Period 1: Benga and Zambeze

9.3.6 An internal memo titled "*Riversdale Acquisition Assumptions*", dated March 2012, explains that, at acquisition, the quality discounts and penalty assumptions were[314]:

(a) Benga: 100% for HCC and approximately 70% for Thermal Coal; and

(b) Zambeze: an average of 96% for HCC and approximately 70% for Thermal Coal.

9.3.7 The quality discounts and penalty assumptions in the Key Models in Period 1 broadly reflect these assumptions and therefore do not appear unreasonable.

Period 2: Benga

9.3.8 In a report titled "*Rio Tinto Coal Mozambique – 2011 Benga 3365C competent person Resources and Reserves report*", dated March 2012, it is set out that Rio Tinto assumed a 97.5% discount to HCC and 75.0% discount to Thermal Coal from Benga[315]. These quality discounts and penalty assumptions are reflected in the Key Models in Periods 2 and 3 and therefore do not appear unreasonable.

Period 2: Zambeze

9.3.9 An email from Ashley Conroy, Group Advisor – Coal Technology, RTE ("**Mr Conroy**") to Mr Andrew Woodley, Chief Operating and Development Officer, RTCM ("**Mr Woodley**") dated 3 May 2012, explains that "*it is proposed that the price estimate for Zambeze coal is 92% of the hard coking coal price, with a range of 90-94%*"[316]. This pricing estimate is broadly reflected as the quality discounts and penalty assumptions in the Key Models in Period 2 and Period 3 and therefore do not appear unreasonable, with the exception of the July 2012 Reference Case Model. In relation to the July 2012 Reference Case Model, I have seen

[314] Internal memo, titled "*Riversdale Acquisition Assumptions*", dated March 2012, pages 2 and 3 [RT_00201165 to RT_00201168]
[315] Report, titled "*Rio Tinto Coal Mozambique – 2011 Benga 3365C competent person Resources and Reserves report*", dated March 2012, page 40 [RT_00184496 to RT_00184660]
[316] Email from Mr Conroy to Mr Woodley, dated 3 May 2012, subject "*Revised CSR and Pricing Estimates for Zambeze*" [RT_SEC_00115297 to RT_SEC_00115301]

evidence that the quality discounts and penalty assumption for HCC (of 87.5%) is consistent with RTCM's Conceptual Growth Programme[317].

Periods 2 and 3: Tete East and Minjova

9.3.10 In a spreadsheet titled "*2012 04 25 Tete East Minjova Matrix*", dated 25 April 2012, which was prepared by Mr Dupree it is set out that at 25 April 2012[318]:

(a) Rio Tinto was assuming quality discounts and penalty assumptions of 92% for HCC and 75% for Thermal Coal for Tete East; and

(b) Rio Tinto was assuming quality discounts and penalty assumptions of 97.5% for HCC and 100% for Thermal Coal for Minjova.

9.3.11 With the exception of the November 2012 Impairment Model, the Key Models in Periods 2 and 3 broadly reflect these quality discounts and penalty assumptions and therefore do not appear unreasonable. In the November 2012 Impairment Model, Rio Tinto assumed a quality premium (rather than a discount). I have also seen an email from Mr Carter, dated 19 November 2012[319], which states that "*we will leave Minjova alone, assuming* […] *110% of PEG*" for Thermal Coal, but I have not seen anything which explains why such a premium is appropriate.

9.4 The applicable discount rate

9.4.1 Whilst an increase in the discount rate decreases the computed NPV, a decrease in the discount rate increases the computed NPV. It is evident from Figure 7A that, as a result of changes to the discount rate[320], the computed NPV of the RTCM Assets increased in Periods 2 and 3. In

[317] Conceptual Growth Programme [RT_00325682 to RT_00325791]
[318] Spreadsheet, titled "*2012 04 25 Tete East Minjova Matrix*", dated 25 April 2012 [RT_00278719]. I note that in an email from Mr Dupree to Mr Morris, Mr Maglione and Troy Harper, Principal Business Analyst, RTCM ("**Mr Harper**"), dated 25 April 2012, subject "*FW: Minjova Assumptions*", Mr Dupree suggests a 97.5% discount for HCC for Tete East, I have assumed this is a typographical error as this discount does not match the attached spreadsheet [RT_00278715 to RT_00278718]
[319] Email from Mr Carter to Kim Kirkland, Manager – Strategic Production Planning, RTCM ("**Ms Kirkland**"), dated 19 November 2012, subject "*RTCM SPP Working Assumptions*" [RT_SEC_00008185 to RT_SEC_00008188]
[320] The impact in Figure 7A also takes into account the change in the valuation date in the Key Models

this Section I therefore consider the changes in the discount rate in the Post Transaction Period:

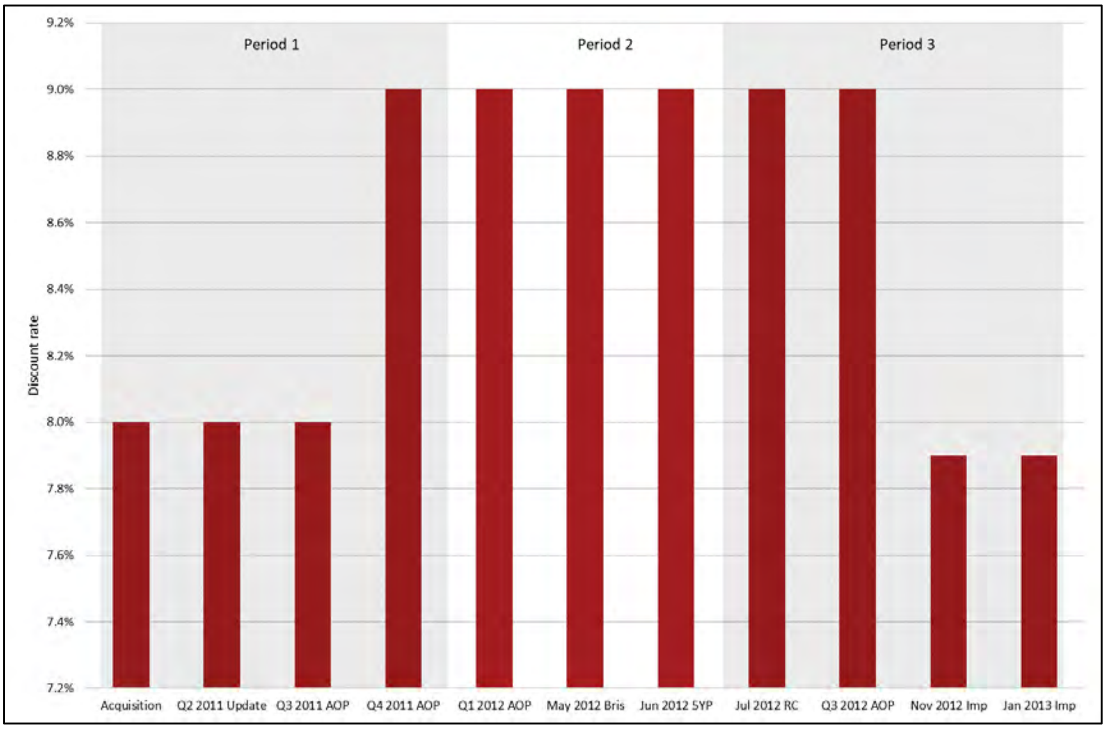
(a) I first identify the discount rate applied in the Key Models (paragraphs 9.4.2 to 9.4.3); and

(b) I then assess the reasonableness of these assumptions (paragraphs 9.4.4 to 9.4.9).

The discount rate applied in the Key Models

9.4.2 In the graph below, I summarise the discount rates applied in each of the Key Models:

Figure 9C: The Discount rate applied in each of the Key Models[321]



9.4.3 Therefore, the discount rates in the Acquisition Model to Q3 2011 AOP Model were 8%. Thereafter, they increased to 9% with the exception of the two Impairment Models, which included discount rates of 7.9%. I note that in the Deloitte PPA Report, Deloitte applied significantly higher discount rates by tenement, as follows:

[321] The Drewe Model/the Key Models

Table 9F: The discount rates applied in the Deloitte PPA Report[322]

	Low	High
Benga	10.5%	11.5%
Zambeze	11.5%	12.5%
Tete East	13.0%	14.0%

My assessment of the reasonableness of the discount rate applied in the Key Models

<u>The discount rates of 8.0% in the Acquisition Model to the Q3 2011 AOP Model</u>

9.4.4 I have identified evidence which explains that, until "*late*" 2011, Rio Tinto applied a discount rate for all RTCM valuation purposes (except for impairment tests) of 8%[323] (being a 7% discount rate plus a 1% "*country risk premium*"[324, 325]). On the basis of the available information, this discount rate appears reasonable. As I explain in Section 5.6, if the Plan NPVs were used as a basis for assessing the FVLCS of the RTCM Assets, the discount rate would need to be adjusted to be that of a market participant.

<u>The discount rates of 9.0% in the Acquisition Model to the Q4 2011 AOP Model to Q3 2012 AOP Model</u>

9.4.5 I have identified evidence which explains that, from "*late*" 2011, Rio Tinto applied a discount rate for all RTCM valuation purposes (except for impairment tests) of 9%[326] (being an 8% discount rate plus a 1% "*country risk premium*"). On the basis of the available information, this discount rate appears reasonable. As I explain in Section 5.6, if the Plan NPVs were used as a basis for assessing the FVLCS of the RTCM Assets, the discount rate would need to be adjusted to be that of a market participant.

[322] Deloitte PPA Report, page 30 [RT_00180990 to RT_00181048]
[323] Email from Mr Brewster to Mr Elliot, dated 3 September 2012, subject "*WACC for impairment calculations*" [RT_00396080 to RT_00396089]
[324] Country risk premium represents the additional return or premium demanded by investors to compensate them for the higher risk associated with investing in a particular county. Factors which may lead to the higher risk include political factors, economic risks such as recession or high inflation and adverse government regulations.
[325] I note that, in relation to the 1% country risk premium applied in the Acquisition Model, the Project Mercury team explained that the "*country risk premium took no account of the risk of barging not being approved, but was based on Global Insight data which took no account of the specific situation of Riversdale in terms of barging approval and the Capital Gains Tax*" (Paper titled "*Project Mercury – Commercial*", undated, page 12 [RT_00003749 to RT_00003778])
[326] Email from Mr Brewster to Mr Elliot, dated 3 September 2012, subject "*WACC for impairment calculations*" [RT_00396080 to RT_00396089]

<u>The discount rates of 7.9% in the Impairment Models</u>

9.4.6 The discount rate used in the impairment models (of 7.9%) represents Rio Tinto's assessment of the discount rate of a market participant, including a country risk premium of 1%[327]. I have identified evidence which explains how this discount rate was computed (by reference to comparable companies, including the identities of these comparable companies[328]). I have reviewed this analysis and, in my view, the discount rate applied by Rio Tinto is reasonable, albeit at the low end of a reasonable range.

<u>The discount rates in the Deloitte PPA Report</u>

9.4.7 As identified in Table 9F above, the discount rates applied in the Deloitte PPA Report are significantly greater than the discount rates applied by Rio Tinto in the Key Models. I have therefore analysed the discount rates in the Deloitte PPA Report in order to assess whether these discount rates raise questions as to the reasonableness of the discount rates applied in the Key Models (which, as I explain above, at face value appear reasonable).

9.4.8 Table 9F identifies that, not only are the discount rates applied by Deloitte higher than the discount rates in the Key Models, they are also different depending upon the relevant tenement: from an average of 11.0% for Benga, 12.0% for Zambeze and 13.5% for Tete East. It is clear to me, therefore, that the discount rates applied by Deloitte have been adjusted to reflect the relevant risks of the tenements. This is different to the approach in, for example, the Impairment Models, because the Impairment Models reflect the risks of the tenements by reference to probabilistic weighting, specifically[329]:

(a) a weighting of 75% applied to the computed value of Zambeze; and

(b) Tete East being reflected as part of the potential upside.

9.4.9 Therefore, the discount rates applied in the Deloitte PPA Report are not directly comparable to the discount rates applied in the Key Models (including the two Impairment Models) and they do not call into question the reasonableness of the rates in the Key Models. They do,

[327] First RTCM Impairment Confirmation [RT_00258742]; Second RTCM Impairment Confirmation [RT_00258850]
[328] Email from Mr Brewster to Mr Elliot, dated 3 September 2012, subject "*WACC for impairment calculations*" [RT_00396080 to RT_00396089]
[329] See Table 6I

however, confirm that if the cashflows do not appropriately take into account the risks associated with the cashflows (by probabilistic weightings) the discount rate should be increased accordingly.

9.5 Conclusion on the reasonableness of the economic assumptions assumed in the Key Models

9.5.1 Considering the economic assumptions adopted in the Key Models in the light of (i) Rio Tinto's contemporaneous valuation guidelines; (ii) the requirements of a FVLCS assessment undertaken in accordance with IFRS and Rio Tinto's Controller's Manual; and (iii) the available contemporaneous evidence of the facts and circumstances that existed in the Post Transaction Period, my conclusions are as follows:

(a) the long-term commodity prices reflected in the Key Models were reasonable, with the exception of the May 2012 Brisbane Model and the July 2012 Reference Case Model;

(b) the quality discount and penalty assumptions reflected in the Key Models do not appear unreasonable; and

(c) the discount rates reflected in the Key Models were reasonable. However, if a Plan NPV was to be used as the basis for a FVLCS in an impairment test, the discount rate would require adjusting so that it represented the discount rate of a market participant.

10 Physical assumptions

10.1 Introduction

10.1.1 As explained in PEG, "*physical assumptions will have a key impact on the whole valuation of the project*"[330]. In this Section I identify the physical assumptions in the Key Models and I explain the impact of changes in these assumptions on the computed NPVs. I also consider whether these physical assumptions appear reasonable in the light of:

(a) Rio Tinto's contemporaneous valuation guidelines, including PEG;

(b) the requirements of a FVLCS assessment undertaken in accordance with IFRS and Rio Tinto's Controller's Manual; and

(c) the available contemporaneous evidence of the facts and circumstances that existed in the Post Transaction Period.

10.1.2 The physical assumptions that I have considered comprise[331]:

(a) the total saleable production over the life of the mines (or LOM) (**Section 10.2**). In the Key Models the saleable production is a product of the ROM (being run of mine, the quantity of ore produced from the mines for processing) and the yield (the proportion of saleable production to ROM)[332]. I analyse the ROM and saleable production assumed for each mine in each of the Key Models and I conclude that, in relation to Zambeze, Tete East and Minjova, the assumptions applied in certain of the Key Models do not appear reasonable. I reach this conclusion because, based on the available information, the ROM production assumed in certain of the Key Models is greater than the ROM production computed by reference to Rio Tinto's Apparent Conversion Ratios. I also identify that, when determining the FVLCS of the RTCM Assets in the context of an impairment test:

[330] PEG, Volume 2, page 28, Section 7.2.1 [RT_SEC_00115484 to RT_SEC_00115541]
[331] In Figure 7A, the impact of the LOM production and annual production assumptions on the computed NPV of the RTCM Assets is presented together
[332] See paragraph 4.6.8

(i) probabilistic risk weightings would have been required to have been applied in relation to Zambeze; and

(ii) Tete East and Minjova would have been required to have been included as potential upside; and

(b) the annual steady-state production assumptions for each mine (**Section 10.3**). This includes considering the assumptions in the Key Models relating to:

(i) Ramp-up (which, as I explain in paragraph 4.6.19 above, refers to the annual production in the period prior to the mines reaching their annual steady-state production); and

(ii) annual steady-state production (which, as I explain in paragraph 4.6.19 above, refers to the annual production in the period after Ramp-up).

I conclude that, given the facts and circumstances that existed in the Relevant Period (as set out in the available contemporaneous information), the Ramp-up and annual steady-state production assumptions in certain of the Key Models are not reasonable.

10.2 The LOM saleable production assumptions

10.2.1 In this Section I consider the LOM saleable production assumptions in the Key Models:

(a) I first identify the LOM production assumptions in the Key Models (paragraphs 10.2.2 to 10.2.3); and

(b) I then assess the reasonableness of these assumptions (paragraphs 10.2.4 to 10.2.31).

The LOM saleable production assumptions in the Key Models

10.2.2 In the graph below I set out the total LOM saleable production by tenement (100% Share), in each of the Key Models. I note that in the January 2013 Impairment test:

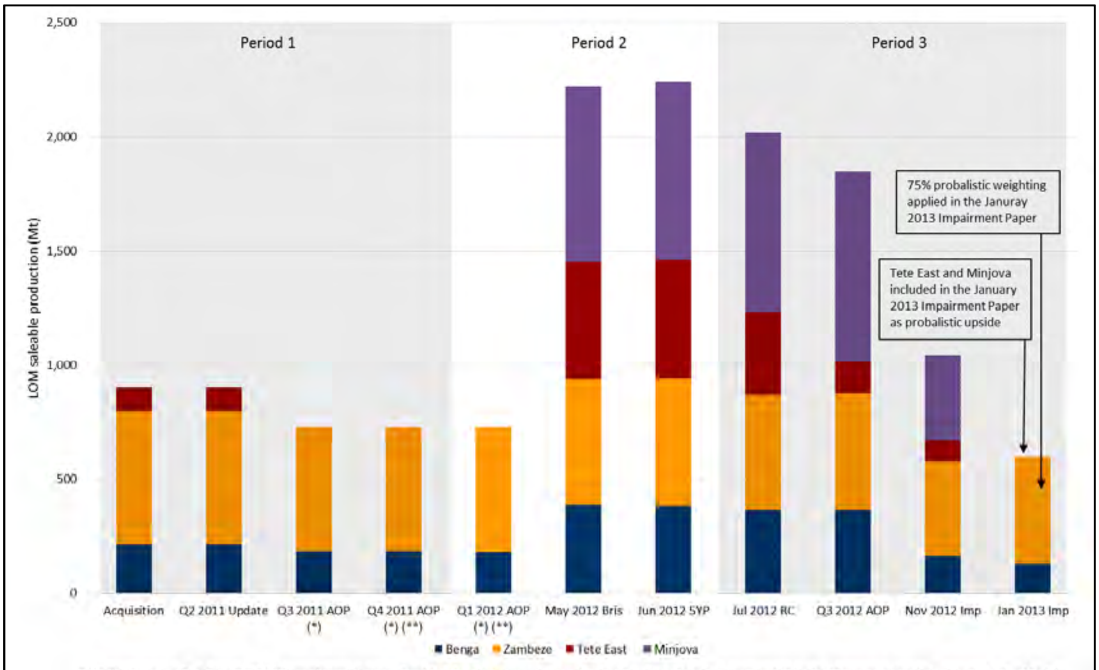
(a) a probabilistic weighting of 75% is applied to the computed value of Zambeze tenement to reflect its early stage[333]. This means that, whilst the computed NPV of Zambeze in

[333] January 2013 Impairment Paper, Exhibit 3 [RT_00257820 to RT_00257836]

the January 2013 Impairment Model was US$597 million, when assessing the FVLCS of the RTCM Assets, Zambeze was included at a value of US$448 million (being US$597 million x 75%); and

(b) Tete East and Minjova are not included, although a potential upside of US$48 million was included in the FVLCS to reflect "*upside potential*"[334].

Figure 10A: The LOM saleable production in the Key Models (100% Share)[335]



* Whilst there is a Tete East ("*EL945L*") worksheet in these Key Models which computes a value for Tete East, Tete East is excluded in the "*Summary*" worksheet in these Key Models
** Whilst there is a "*Minjova*" worksheet in these Key Models which computes a value for Minjova, Minjova is excluded in the "*Summary*" worksheet in these Key Models

10.2.3 It is evident from Figure 10A that the May 2012 Brisbane Model assumed a significant increase in the LOM saleable production compared with the earlier Key Models. This increase was a result of:

(a) an increase in the saleable production from Benga; and

(b) the inclusion of saleable production from Tete East and Minjova. In paragraphs 8.3.17 to 8.3.21 above, I explain the importance of this additional production in the May 2012

[334] January 2013 Impairment Paper, Exhibit 3 [RT_00257820 to RT_00257836]
[335] The Drewe Model/the Key Models

Brisbane Model in the context of a requirement for a low cost high volume Greenfield Railway.

My assessment of the reasonableness of the LOM saleable production assumptions

10.2.4 In Riversdale's 2010 Annual Financial Statements, Riversdale reported the following reserves and resources:

Table 10A: The reserves and resources reported in Riversdale's 2010 Annual Financial Statements[336]

	Benga *Mt*	Zambeze *Mt*	Tete East *Mt*
Reserves			
Proven	346	-	-
Probable	156	-	-
Total reserves	***502***	**-**	**-**
Resources			
Measured	710	-	-
Indicated	362	2,365	-
Inferred	2,960	6,680	-
Total resources	***4,032***	***9,045***	**-**
Total reserves and resources	**4,534**	**9,045**	**-**

10.2.5 On the basis of these reported figures, in the Acquisition Model:

(a) Benga's saleable production was based upon 90%[337] of the reserves being converted into mineable material, leading to a ROM production of 452Mt[338]. At an average yield of 47%[339], LOM saleable production was expected to be 215Mt[340]. As such, the 4,032Mt of resources were not taken into account in the Acquisition Model[341];

336 Riversdale's 2010 Financial Statements, page 17
337 452Mt ROM production / 502Mt reserves = 90%
338 The Drewe Model/the Key Models
339 Deloitte PPA Report, page 22 [RT_00180990 to RT_00181048]
340 Acquisition Model, "*Benga River*" worksheet [RT_00337763]
341 In the Deloitte PPA Report, Deloitte explained that it applied an additional 10% to 15% premium to the assessed value to account for the potential for Benga's resources to be converted to reserves and / or additional resource discoveries. Deloitte PPA Report, page 31, Section 7.2.3 **[**RT_00180990 to RT_00181048**]**

(b) Zambeze's saleable production was based upon 1,530Mt[342] of the resources being upgraded to ROM production. At an average yield of 38%, LOM saleable production was expected to be 583Mt[343, 344]; and

(c) Tete East's saleable production was based upon 200Mt of minerals being upgraded to proven and probable reserves[345] and 77% of these being converted into mineable material, leading to a ROM production of 153Mt[346]. At an average yield of 69%, LOM saleable production was expected to be 105Mt[347].

10.2.6 However, prior to the Transaction, Rio Tinto's due diligence appears to have identified that the reserves and resources reported in Riversdale's 2010 Annual Financial Statements would likely require writing down[348]. Then in late 2011/early 2012 there was a write down in RTCM's reported reserves and resources[349].

10.2.7 The table below summarises the reserves and resources reported in Rio Tinto's 2011 Annual Financial Statements:

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342 Acquisition Model, "*Zambeze*" worksheet [RT_00337763]
343 Acquisition Model, "*Zambeze*" worksheet [RT_00337763]
344 In the Deloitte PPA Report, Deloitte explained that it applied an additional 10% to 15% premium to the assessed value to account for the potential for Zambeze's resources to be converted to reserves and / or additional resource discoveries. Deloitte PPA Report, page 31, Section 7.2.3 **[**RT_00180990 to RT_00181048**]**
345 Deloitte PPA Report, page 23 [RT_00180990 to RT_00181048]
346 Acquisition Model, "*EL945*" worksheet [RT_00337763]
347 Acquisition Model, "*EL945*" worksheet [RT_00337763]
348 RTX Due Diligence Report, pages 3 and 4 [RT_00191385 to RT_00191456], RT T&I Due Diligence Report, Section 1, page 4 [RT_SEC_00057889 to RT_SEC_00058070] and RT T&I Due Diligence Report, Section 11.1, page 135 [RT_SEC_00057889 to RT_SEC_00058070]
349 For example, in an email to Eric Finlayson, Managing Director, RTCM ("**Mr Finlayson**"), dated 19 December 2011, Mr Woodley explained: "*I today met with Rod Smith* [Chief Advisor – Mining, TI ("**Mr Smith**")] *who we engaged (his team and a consultant) to review the reserves and resource statement. Whilst it is not finalised and may move around a little, the current state of play is narrowing the end point range. Unfortunately still a sizeable write down – more than due diligence. Will challenge a sizable and long life Benga mine on current reserves. Another challenge for us to take on and find a pathway through*" (Email from Mr Woodley to Mr Finlayson, dated 19 December 2011, subject "*Reserves and Resource*" **[**RT_00238326 to RT_00238327**]**). In a subsequent email dated 22 December 2011, Mr Woodley provided the following estimates of the "*sizeable write down*" (more than 50%) to the reserves and resources reported in Riversdale's 2010 Annual Financial Statements: "- *Benga resource written down from 4.032bn tonnes to ~1bn tonnes (approx. 25% of prior Riversdale stated) - Benga reserves appear to be in the range of 230-500mt compared with Riversdale's declared reserve of 502mt. The Benga reserves have some unresolved variables, hence the wider range*" (Email from Mr Woodley to Brendon Brodie-Hall, Mining Executive – Energy, RTE ("**Mr Hall**") (cc: Mr Finlayson), dated 22 December 2011, subject "*RE: RTCM Reserves and Resource*" [RT_00238416 to RT_00238418])

Table 10B: The reserves and resources reported in Rio Tinto's Annual Financial Statements[350]

	Benga	Zambeze	Tete East
	Mt	***Mt***	***Mt***
Reserves			
Proven	241	-	-
Probable	70	-	-
Total reserves	***311***	**-**	**-**
Resources			
Measured	241	828	-
Indicated		767	-
Inferred	61	389	-
Total resources	***302***	***1,984***	**-**
Total reserves and resources	**613**	**1,984**	**-**

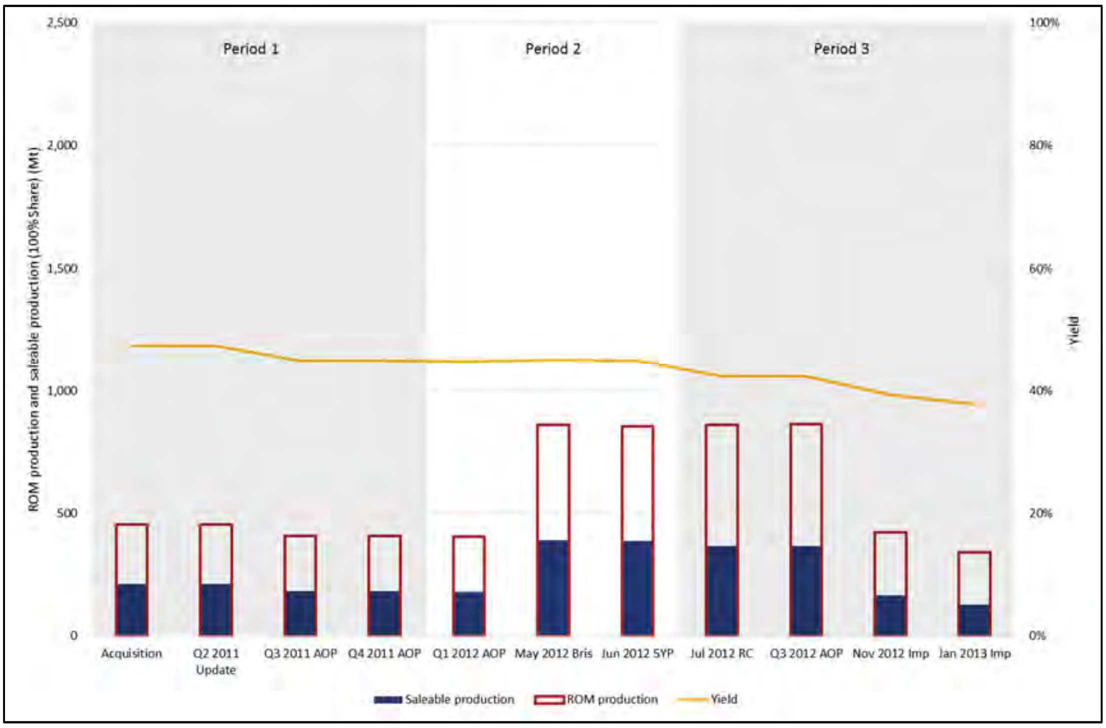
10.2.8 In the context of the above, I now address the RTCM tenements in turn:

Benga

10.2.9 The graph below summarises the ROM production, yield and saleable production of Benga in each of the Key Models:

[350] Rio Tinto's 2011 Annual Financial Statements, pages 49 to 52 and Rio Tinto's 2012 Annual Financial Statements, pages 55 and 59. I note that Rio Tinto's 2011 Annual Financial Statements erroneously included Benga reserves in the presented Benga resources figures, as explained by Rio Tinto's 2012 Annual Financial Statements, page 59, the January Impairment Paper, page 13 [RT_00257820 to RT_00257836] and Report, titled "*Rio Tinto Coal Mozambique – 2011 Benga 3365C competent person Resources and Reserves report*", dated March 2012, page 2 [RT_00184496 to RT_00184660]

Figure 10B: The ROM production, yield and saleable production of Benga (100% Share)[351]



10.2.10 It is evident from Figure 10B and the Drewe Model that:

(a) during Period 1, there were minor decreases in ROM production and yield, leading to a decrease in the LOM saleable production – this appears to have been based on "*RTCM Mine plan 5/9/11*"[352];

(b) from the May 2012 Brisbane Model, there was a significant increase in ROM production, leading to a significant increase in LOM saleable production. This increase was in the context of the downgrading of the reserves and resources referred to in paragraph 10.2.6 above; and

(c) in the November 2012 Impairment Model and the January 2013 Impairment Model, the ROM production decreased significantly, leading to a significant decrease in LOM saleable production.

[351] The Drewe Model/the Key Models
[352] Q3 2011 AOP Model [RT_00263934]

10.2.11 The table below compares the ROM production assumed in the Q4 2011 AOP Model with the ROM production that would be assumed if the Apparent Conversion Ratios are applied to the reserves and resources reported in the 2011 Annual Report.

Table 10C: Benga – analysis of ROM in the Q4 2011 AOP Model based upon the Apparent Conversion Ratios

	JORC	Conversion ratio	Calculation	ROM production (LOM)
	Mt			*Mt*
Reserves - Proven	241	100%	241Mt x 100%	241
Reserves - Probable	70	90%	70Mt x 90%	63
Resources - Measured & Indicated	241	70%	241Mt x 70%	169
Resources - Inferred	61	30%	61Mt x 30%	18
Resources - Speculative	-	30%	-	-
Total ROM production based upon Apparent Conversion Ratios				**491**
Actual ROM production in the Q4 2011 AOP				**405**
Difference				**86**

10.2.12 Therefore, by reference to the Apparent Conversion Ratios, the ROM production assumed in the Q4 2011 AOP Model appears reasonable – this is because the volume of ROM Production included in the Q4 2011 AOP Model is less than the volume of production computed based upon the Apparent Conversion Ratios.

10.2.13 The table below compares the ROM production assumed in the Key Models in Periods 2 and 3[353] with the ROM production that would be assumed if the Apparent Conversion Ratios are applied to the reserves and resources reported in Rio Tinto's 2011 Annual Financial Statements[354].

[353] With the exception of the January 2013 Impairment Model
[354] See Table 10B above

Table 10D: Benga – analysis of ROM in the Key Models based upon the Apparent Conversion Ratios

Key Model	ROM production (LOM)		Difference
	Assumed in Key Model	Based upon Apparent Conversion Ratios	
	Mt	*Mt*	*Mt*
Q1 2012 AOP	405	491	86
May 2012 Bris	860	491	(369)
Jun 2012 5YP	856	491	(365)
Jul 2012 RC	862	491	(371)
Q3 2012 AOP	862	491	(371)
Nov 2012 Imp	422	491	69

10.2.14 Therefore, by reference to the Apparent Conversion Ratios, the ROM production assumed in the May 2012 Brisbane Model to Q3 2012 AOP Model appears unreasonable – this is because the volumes of ROM Production included in the Key Models are significantly greater than the volume of production computed based upon the Apparent Conversion Ratios. Reducing the saleable production to be compliant with the Apparent Conversion Ratios reduces the NPV computed in the May 2012 Brisbane Model as follows:

Table 10E: Sensitivity analysis – reducing the saleable production in the May 2012 Brisbane Model to be consistent with the Apparent Conversion Ratios[355]

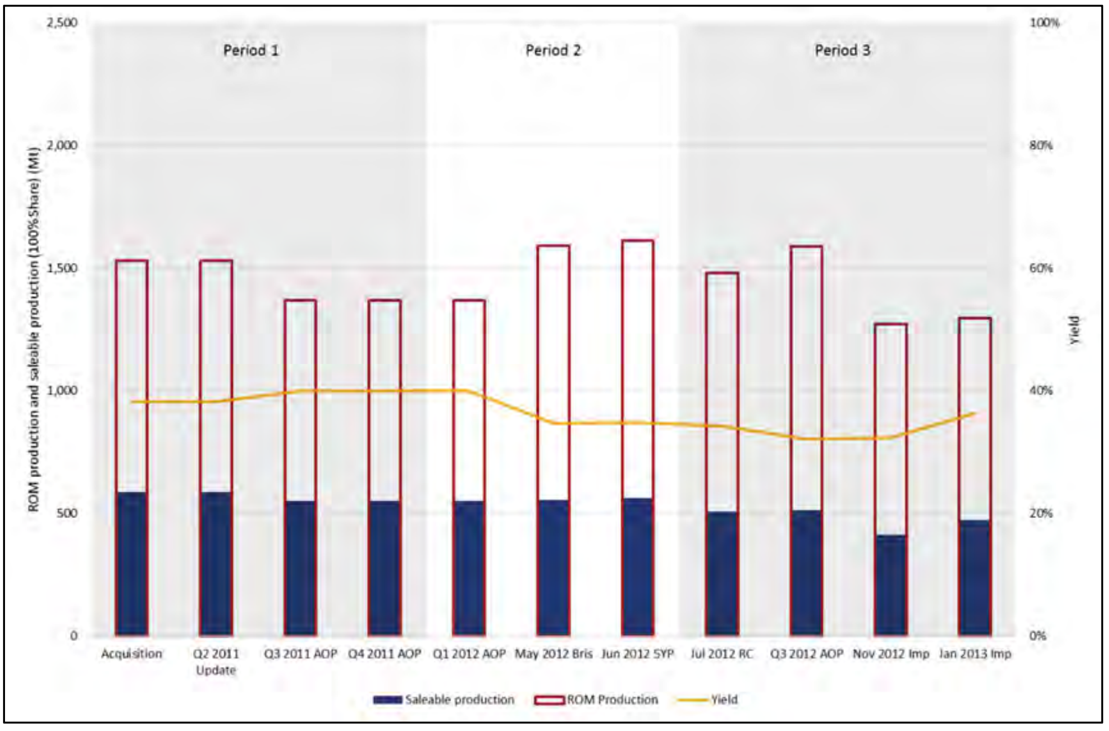
	May 2012 Brisbane Model	Revised NPV	Impact of Sensitivity
	US$'m	*US$'m*	*US$'m*
Benga	561	493	(68)
Zambeze	379	379	-
Tete East	354	354	-
ZAC	-	-	-
Minjova	816	816	-
Infrastructure enablers	(3,115)	(3,115)	-
Other	18	18	-
Total (excluding net debt / cash)	**(987)**	**(1,054)**	**(68)**

[355] Mazars' analysis

<u>Zambeze</u>

10.2.15 The graph below summarises the ROM production, yield and saleable production of Zambeze in each of the Key Models:

Figure 10C: The ROM production, yield and saleable production of Zambeze (100% Share)[356]



10.2.16 It is evident from Figure 10C and the Drewe Model that:

(a) during Period 1, there were decreases in ROM production and increases in the yield, leading to LOM saleable production remaining broadly consistent – this appears to have been based on "*RTCM mine plan sep 2011*"[357];

(b) in the May 2012 Brisbane Model, there was a significant increase in ROM production. This increase was offset by a decrease in the yield leading to LOM saleable production remaining broadly consistent. This increase in ROM production was in the context of the downgrading of the reserves and resources referred to in paragraph 10.2.6 above; and

[356] The Drewe Model/the Key Models
[357] Q3 2011 AOP Model [RT_00263934]

(c) in the November 2012 Impairment Model and the January 2013 Impairment Model, the ROM production decreased, leading to a decrease in LOM saleable production.

10.2.17 The table below compares the ROM production assumed in the Q4 2011 AOP Model with the ROM production that would be assumed if the Apparent Conversion Ratios are applied to the reserves and resources reported in the Rio Tinto's 2011 Annual Financial Statements[358].

Table 10F: Zambeze – analysis of ROM in the Q4 2011 AOP Model based upon the Apparent Conversion Ratios

	JORC *Mt*	Conversion ratio	Calculation	ROM production (LOM) *Mt*
Reserves - Proven	-	100%	-	-
Reserves - Probable	-	90%	-	-
Resources - Measured	828	70%	828Mt x 70%	580
Resources - Indicated	767	70%	767Mt x 70%	537
Resources - Inferred	389	30%	389Mt x 30%	117
Resources - Speculative	-	30%	-	-
Total ROM production based upon Apparent Conversion Ratios				**1,233**
Actual ROM production in the Q4 2011 AOP				**1,371**
Difference				**(138)**

10.2.18 Therefore, by reference to the Apparent Conversion Ratios, the ROM production assumed in the Q4 2011 AOP Model appears unreasonable – this is because the volume of ROM Production included in the Q4 2011 AOP Model is more than the volume of production computed based upon the Apparent Conversion Ratios.

10.2.19 The table below compares the ROM productions assumed in the Key Models in Periods 2 and 3[359] with the ROM productions that would be assumed if the Apparent Conversion Ratios are applied to the reserves and resources reported in the 2011 Annual Report[360].

[358] See Table 10B above
[359] With the exception of the January 2013 Impairment Model
[360] See Table 10B above

Table 10G: Zambeze – analysis of ROM in the Key Models based upon the Apparent Conversion Ratios

Key Model	ROM production (LOM)		
	Assumed in Key Model	Based upon Apparent Conversion Ratios	Difference
	Mt	*Mt*	*Mt*
Q1 2012 AOP	1,371	1,233	(138)
May 2012 Bris	1,591	1,233	(358)
Jun 2012 5YP	1,612	1,233	(379)
Jul 2012 RC	1,480	1,233	(247)
Q3 2012 AOP	1,589	1,233	(356)
Nov 2012 Imp	1,274	1,233	(41)

10.2.20 Therefore, by reference to the Apparent Conversion Ratios, the ROM production assumed in the May 2012 Brisbane Model to November 2012 Impairment Model appears unreasonable – this is because the volumes of ROM production included in the Key Models is significantly greater than the volumes of production computed based upon the Apparent Conversion Ratios. Reducing the saleable production to be compliant with the Apparent Conversion Ratios reduces the NPV computed in the May 2012 Brisbane Model as follows:

Table 10H: Sensitivity analysis – reducing the saleable production in the May 2012 Brisbane Model to be consistent with Apparent Conversion Ratios[361]

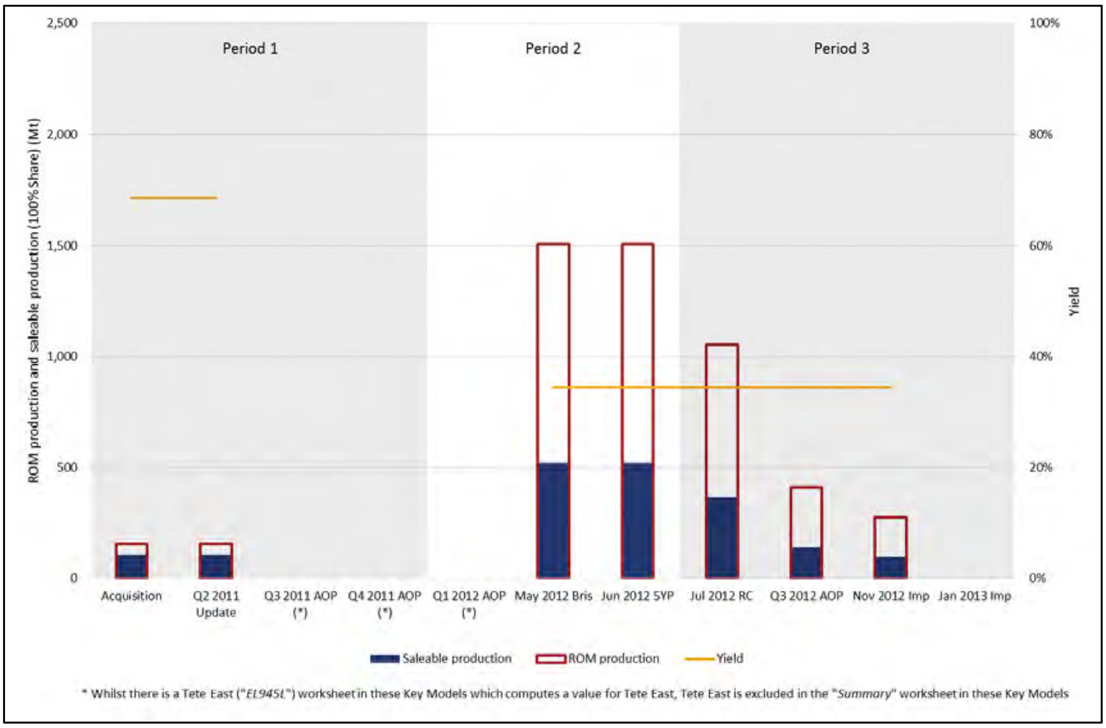
	May 2012 Brisbane Model	Revised NPV	Impact of Sensitivity
	US$'m	*US$'m*	*US$'m*
Benga	561	561	-
Zambeze	379	358	(22)
Tete East	354	354	-
ZAC	1,295	1,295	-
Minjova	816	816	-
Infrastructure enablers	(3,115)	(3,115)	-
Other	18	18	-
Total (excluding net debt / cash)	**(987)**	**(1,008)**	**(22)**

[361] Mazars' analysis

Tete East

10.2.21 The graph below summarises the ROM production, yield and saleable production of Tete East in each of the Key Models:

Figure 10D: The ROM production, yield and saleable production of Tete East (100% Share)[362]



10.2.22 It is evident from Figure 10D and the Drewe Model that:

(a) in the Acquisition Model and in the Q2 2011 Update Model, the LOM saleable production of 105Mt was based upon ROM production of 153Mt and a yield of 69%;

(b) as I explain in Figure 10D above, Tete East was excluded from the computed value of the RTCM Assets in the Q3 2011 AOP Model to the Q1 2012 AOP Model;

(c) in the May 2012 Brisbane Model, a significant amount of saleable production was assumed (518Mt). I have not seen any document[363] which explains the basis for this assumption; and

[362] The Drewe Model/the Key Models
[363] In my review of over 15,000 documents

(d) in the June 2012 5YP Model to November 2012 Impairment Model, whilst the yield remained constant at 34%, the ROM production decreased to 1,055Mt (in the July 2012 Reference Case Model), then to 409Mt (in the Q3 2012 AOP Model) and finally to 273Mt (in the November 2012 Impairment Model). Tete East was not included in the January 2013 Impairment Model, but in the January 2013 Impairment Paper, value was attributed to potential resource upside.

10.2.23 PEG required that, in a Plan NPV, "[t]*he volume of ore should not include all the upside or blue sky that can be envisaged, although this potential can be shown as a sensitivity if appropriate*"[364]. In the Key Models, particularly the May 2012 Brisbane Model to the July 2012 Reference Case Model where significant saleable production was assumed from Tete East, there is no indication that this requirement was met. The Project Mercury team specifically considered Tete East to be "*blue-sky exploration*"[365].

10.2.24 The Project Mercury review team also explained why, "*despite the lack of data*", value had been ascribed to Tete East in the Acquisition Model using a DCF analysis and that there were concerns within Rio Tinto in this approach:

"*In terms of tonnes to be mined, an underground mine in L945* [Tete East] *was included in the Central Estimate despite the lack of data. This was considered better than using a $ per tonne estimate for the upside contained in the resource. T&I did not want this included in the main valuation and so it was presented separately at the bottom of the valuation table, but included in the total presented to the November IC with no explanation. In itself, this seems a reasonable approach to have taken all other things including transportation being equal, but they were not*"[366].

10.2.25 As referred to by the Project Mercury review team, Figure 10E below shows the presentation of Tete East ("*EL 945*") "*separately at the bottom of the valuation table*" in the Acquisition Model:

[364] PEG, Volume 2, page 29, Section 7.2.1 [RT_SEC_00115484 to RT_SEC_00115541]
[365] Paper titled "*Project Mercury – Executive Summary*", dated 12 April 2013, page 2 [RT_00001065 to RT_00001091]
[366] Paper titled "*Project Mercury – Commercial*", undated, page 10 [RT_00003749 to RT_00003778]

Figure 10E: Extract from the Acquisition Model

Mine/Project	Project Status	Riversdale Ownership	Valuation - Riversdale share		
			US$M	A$M	A$/share
Benga - via barge to Chinde	Construction	65%	$1,143	$1,153	$4.7
Zambeze - 45Mtpa ROM*	Pre-Feasiblity	100%	$1,575	$1,588	$6.5
Benga & Zambeze			**$2,719**	**$2,741**	**$11.2**
Zululand Anthracite Colliery	Operating	74%	$30	$30	$0.1
Unallocated Overheads		100%	($16)	($16)	($0.1)
Net Debt/Cash		100%	$545	$549	$2.2
Outstanding Options Proceeds		100%	$64	$64	$0.3
Subtotal			**$3,341**	**$3,368**	**$13.8**
EL 945 - Underground Case	Exploration	100%	$344	$347	$1.4
Total Value			**$3,685**	**$3,715**	**$15.2**
** includes 40% sale at value comparable to previous WISCO proposal*			Shares & Options:		244.4

10.2.26 Further, the Project Mercury review team concluded that the valuation of Tete East (and other licenses) as being fully defined projects was "*inappropriate*" and did not "*reflect the uncertainty and risk*":

"*Riversdale assets largely comprised exploration licenses for which RTE was prepared to pay full price. However, in hindsight, valuing these licences as if they were fully defined projects was inappropriate and did not reflect the uncertainty and risk in production volumes and quality, and time and cost to mine and ship*"[367].

10.2.27 Even if it was appropriate to include this production in a CEFC (which would have been contrary to the requirements of PEG), when computing a FVLCS:

(a) Rio Tinto's 2011 Annual Financial Statements explained that in an impairment test "*…non reserve material is only included where there is a high degree of confidence in its economic extraction*"[368]. I have not seen anything which suggests that there was a high degree of confidence in relation to Tete East[369]; and

[367] Paper titled "*Project Mercury – Executive Summary*", dated 12 April 2013, page 14 [RT_00001065 to RT_00001091]

[368] Rio Tinto's 2011 Annual Financial Statements, page 143; Rio Tinto's 2012 Annual Financial Statements, page 151

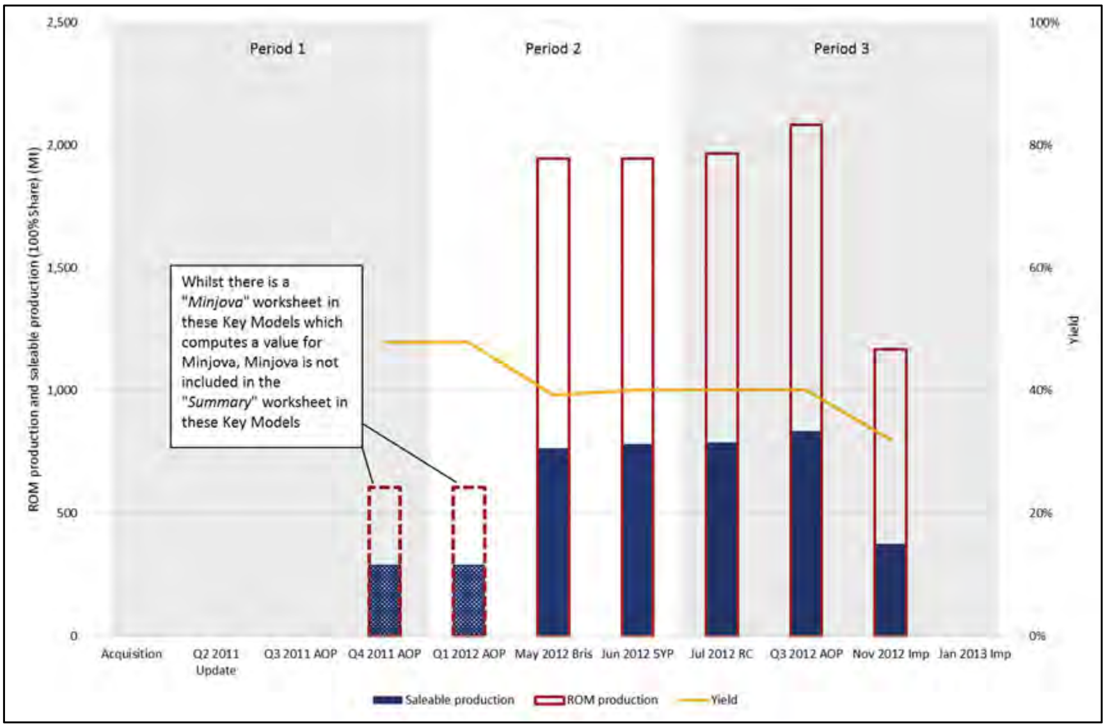
[369] Mr Dupree explains that no reserves or resources were reported for Tete East in early 2012 because "[t]*here wasn't sufficient drilling to make a resource estimate in Tete East at that time*" and that a mine plan was not generated for Tete East until 2013 due to insufficient data being available (and even then the plan was "*very preliminary*") (Mr Dupree deposition transcript, dated 20 February 2019, pages 32 and 43). The Final May 2012 Brisbane Presentation, slide 20 explains that at that time Rio Tinto had "[l]*imited resource knowledge for Tete East and Minjova*" (Final May 2012 Brisbane Presentation [RT_00278107 to RT_00278133])

(b) in relation to what are described as "*growth projects*", they should be included "*at the risk adjustments agreed upon by local management and Controllers*"[370]. Therefore, even if an amount should be included for Tete East in the FVLCS, it should be at a risk adjusted amount.

<u>Minjova</u>

10.2.28 The graph below summarises the ROM production, yield and saleable production of Minjova in each of the Key Models:

Figure 10F: The ROM production, yield and saleable production of Minjova[371]



10.2.29 It is evident from Figure 10F and the Drewe Model that:

(a) a "*Minjova*" worksheet was first included in the Key Models in the Q4 2011 AOP, albeit, as I explain in Figure 10F above, the computed value was not included in the "*Summary*" worksheet. In this worksheet, Rio Tinto assumed ROM production of 603Mt and a LOM saleable production of 289Mt. For the purposes of my report, I have

[370] Internal memo, titled "*Impairment Methodologies 2012*", dated 31 August 2012, page 3 [RT_00101098 to RT_00101101]
[371] The Drewe Model/the Key Models

assumed that in Period 1, Rio Tinto did not have sufficient information to make informed decisions in relation to production from Minjova. My assumption is consistent with my review of the available evidence[372];

(b) in the May 2012 Brisbane Model, Minjova was included for the first time in the total NPV of the RTCM Assets computed by a Key Model. The ROM production was 1,947Mt at a yield of 39%, resulting in LOM saleable production of 764Mt. I have not seen any document[373] which explains the basis for these assumptions. For the purposes of my report I have assumed that, in February 2012, Rio Tinto identified that Minjova was unlikely to produce HCC and that the Thermal Coal produced by Minjova would be, at least partially, only of a quality suitable for domestic applications (rather than the export market). My assumptions are consistent with my review of the available evidence[374]. On this basis, the information available to Rio Tinto is inconsistent with the May 2012 Brisbane Model which assumed that Minjova would produce HCC and Thermal Coal, and that all Thermal Coal produced would be of export market quality. I have also assumed that, in February 2012, Rio Tinto identified that the two most prospective domains in the Minjova deposit would yield up to 150Mt of low ash Thermal Coal and 160Mt of high ash Thermal Coal (totalling 310Mt of Thermal Coal). Again, my assumption is consistent with my review of the available evidence[375]. On this basis, the information available to Rio Tinto is inconsistent with the saleable

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[372] For example, an email from Keith Sims, Exploration Manager, New Opportunities, Africa Eurasia Region, RTE ("**Mr Sims**") to Mr Finlayson, dated 27 October 2011, regarding the Option Agreement explained that: "*Delays at the lab have meant that* [Rio Tinto] *do not yet have sufficient analytical data to make informed decisions on the coal quality*" and that "*in the areas drilled, coking potential is low but there are indications of a shallow thermal resource which is close to rail*" (Email from Mr Sims to Mr Finlayson, dated 27 October 2011, subject "*Minjova*" [RT_00293775]). Further, Mr Dupree explains that in 2011 and first half of 2012 Rio Tinto did not have information about the type of coal Minjova contained and that no reserves or resources were reported for Minjova as there was "*not sufficient information*" (Mr Dupree deposition transcript, dated 20 February 2019, pages 34 and 35)

[373] In my review of over 15,000 documents

[374] For example, in February 2012, RTX published a report titled "*Project Handover Report 2012*" ("**Project Handover Report 2012**"), which set out that initial drilling results "*indicate that the coal is well short of hard coking quality. The potential middlings thermal coal product Coal is more likely to be suitable for domestic applications than for the export market* […] *Current drilling at Minjova is too sparse to demonstrate continuity of either seam structure of coal quality and, therefore, does not constitute a basis for coal resource estimation. The two most prospective domains in the Minjova deposit, on current drilling, have exploration potential for about 600 Mt of coal in-situ, and may yield up to 150 Mt of a low ash thermal coal, and 160 Mt of a high (28%) ash (middlings) thermal coal*". The Project Handover Report 2012 further sets out that "[t]*hese estimates are considered highly likely to be reduced significantly by infill drilling which would be expected to reveal more intense faulting, intrusions and more extensive areas of heat affected coal*" (Project Handover Report 2012, pages 5 and 83 [RT_00183789 to RT_00183889])

[375] Project Handover Report 2012, page 5 [RT_00183789 to RT_00183889]

production included the Key Models between the May 2012 Brisbane Model and the Q3 2012 AOP Model (which are based upon saleable production of between 763Mt and 834Mt); and

(c) for the purposes of my report, I have assumed that the information received by Rio Tinto in relation to Minjova in Period 3 was largely confirmatory of the information available to Rio Tinto by the date that Rio Tinto's Interim Financial Statements were issued. My assumption is consistent with my review of the available evidence[376].

10.2.30 PEG required that, in a Plan NPV, "[t]*he volume of ore should not include all the upside or blue sky that can be envisaged, although this potential can be shown as a sensitivity if appropriate*"[377]. In the Key Models, particularly the May 2012 Brisbane Model to November 2012 Impairment Model where significant saleable production was assumed from Minjova, there is no indication that this requirement was met, particularly in the context of the description in the Project Handover Report 2012.

10.2.31 Even if it was appropriate to include this production in a CEFC (which would have been contrary to the requirements of PEG), when computing a FVLCS:

(a) Rio Tinto's 2011 Annual Financial Statements explain that in an impairment test "*…non-reserve material is only included where there is a high degree of confidence in*

[376] For example, an email from Ms Kevern on 13 September 2012 set out that "*there is not currently any certainty around any future economic benefit that may arise from holding this license (i.e whether there is any viable resource)*" (Email chain between Ms Cope, Mr Sholi and Ms Kevern, subject "*RE: RTCM*", dated 13 September 2012, [RT_00350391 to RT_00350393]). Further, additional coal quality results in relation to Minjova were received in November 2012 which explained that "*Exploration potential for 1,600 million tonnes of coal has been identified within two, fault-bounded, geological domains within the central portion of the deposit…Approximately 600 Mt of coal would be expected to represent potential ROM coal, from which approximately 150 Mt would be a low (10.5%) ash "primary" product and approximately 160 Mt would form a high ash (28%) middlings product… The primary product exhibits swelling properties but would only produce a very low strength coke based on Roga index results. Both the low and high ash product coals have high fuel ratios* […] *which would be expected to affect their acceptance in the thermal coal markets… Insufficient drilling data is available for estimation and classification of resources according to Rio Tinto standards* […] *The deposit is interpreted to have no potential to deliver a hard coking coal product*" (Internal memo, titled "*Minjova Note for the Record*", dated 22 February 2013, pages 4 and 5 [RT_00487213 to RT_00487217])

[377] PEG, Volume 2, page 29, Section 7.2.1 [RT_SEC_00115484 to RT_SEC_00115541]

its economic extraction"[378]. I have not seen anything which suggests that there was a high degree of confidence in relation to Minjova[379]; and

(b) in relation to what are described as "*growth projects*", they should be included "*at the risk adjustments agreed upon by local management and Controllers*"[380]. Therefore, even if an amount should be included for Minjova in the FVLCS, it should be at a risk adjusted amount.

10.3 The annual production assumptions

10.3.1 In this Section I address the annual production assumptions for each mine:

(a) I first identify the annual production assumptions (both steady-state assumptions and Ramp-Up assumptions) in the Key Models (paragraphs 10.3.2 to 10.3.5); and

(b) I then assess the reasonableness of these assumptions (paragraphs 10.3.6 to 10.3.23), in particular in the context of:

(i) certain mining related issues;

(ii) the available Coal Chain infrastructure; and

(iii) other annual production considerations.

The annual production assumptions in the Key Models

<u>The steady-state assumptions</u>

10.3.2 In the tables below, I set out the annual ROM steady-state and annual saleable production steady-state assumptions for each mine site in each of the Key Models[381]:

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[378] Rio Tinto's 2011 Financial Statements, page 143

[379] The Final May 2012 Brisbane Presentation, slide 20 explains that at that time Rio Tinto had "[l]*imited resource knowledge for Tete East and Minjova*". Final May 2012 Brisbane Presentation [RT_00278107 to RT_00278133]

[380] Internal memo, titled "*Impairment Methodologies 2012*", dated 31 August 2012, page 3 [RT_00101098 to RT_00101101]

[381] I note that the Acquisition Model and Q2 2011 Update Model also included 20Mtpa for EL948. This amount was not assumed in any of the other Key Models and was not included in the Deloitte PPA Report in relation to Tete East (Deloitte PPA Report, page 23 [RT_00180990 to RT_00181048]) and therefore I have not included it in my analysis in this report

Table 10I: Annual ROM steady-state assumptions in the Key Models (100% Share)[382]

	Benga	**Zambeze**	**Tete East**	**Minjova**	**Total**
	Mtpa	***Mtpa***	***Mtpa***	***Mtpa***	***Mtpa***
Period 1					
Acquisition	21.2	45.0	6.0	n/a	**72.2**
Q2 2011 Update	21.2	45.0	6.0	n/a	**72.2**
Q3 2011 AOP	21.2	41.6	*	n/a	**62.8**
Q4 2011 AOP	21.2	41.6	*	**	**62.8**
Period 2					
Q1 2012 AOP	21.2	41.6	*	**	**62.8**
May 2012 Bris	15.6	31.5	31.2	41.6	**119.9**
Jun 2012 5YP	15.6	31.5	31.2	41.6	**119.9**
Period 3					
Jul 2012 RC	15.9	31.5	20.8	41.6	**109.8**
Q3 2012 AOP	15.9	33.8	8.0	41.6	**99.3**
Nov 2012 Imp	15.9	33.8	8.0	41.6	**99.3**
Jan 2013 Imp	10.6	20.6	-	-	**31.2**

* Whilst there is a Tete East ("*EL945L*") worksheet in these Key Models which computes a value for Tete East, Tete East is excluded in the "*Summary*" worksheet in these Key Models (see paragraph 6.3.19)
** Whilst there is a "*Minjova*" worksheet in these Key Models which computes a value for Minjova, Minjova is not included in the "*Summary*" worksheet in these Key Models (see paragraph 6.3.19)

[382] The Drewe Model/the Key Models

Table 10J: Annual saleable production steady-state assumptions in the Key Models (100% Share)[383]

	Benga *Mtpa*	Zambeze *Mtpa*	Tete East *Mtpa*	Minjova *Mtpa*	Total *Mtpa*
Period 1					
Acquisition	10.0	17.2	4.5	n/a	**31.7**
Q2 2011 Update	10.0	17.2	4.5	n/a	**31.7**
Q3 2011 AOP	9.5	17.1	*	n/a	**26.6**
Q4 2011 AOP	9.5	17.1	*	**	**26.6**
Period 2					
Q1 2012 AOP	9.5	17.1	*	**	**26.6**
May 2012 Bris	7.0	10.4	10.7	16.6	**44.8**
Jun 2012 5YP	7.0	10.9	10.7	16.6	**45.3**
Period 3					
Jul 2012 RC	7.1	10.0	7.2	16.6	**41.0**
Q3 2012 AOP	7.1	10.0	2.8	16.6	**36.5**
Nov 2012 Imp	7.1	10.0	2.8	13.3	**33.2**
Jan 2013 Imp	4.0	7.5	-	-	**11.5**

* Whilst there is a Tete East ("*EL945L*") worksheet in these Key Models which computes a value for Tete East, Tete East is excluded in the "*Summary*" worksheet in these Key Models (see paragraph 6.3.19)
** Whilst there is a "*Minjova*" worksheet in these Key Models which computes a value for Minjova, Minjova is not included in the "*Summary*" worksheet in these Key Models (see paragraph 6.3.19)

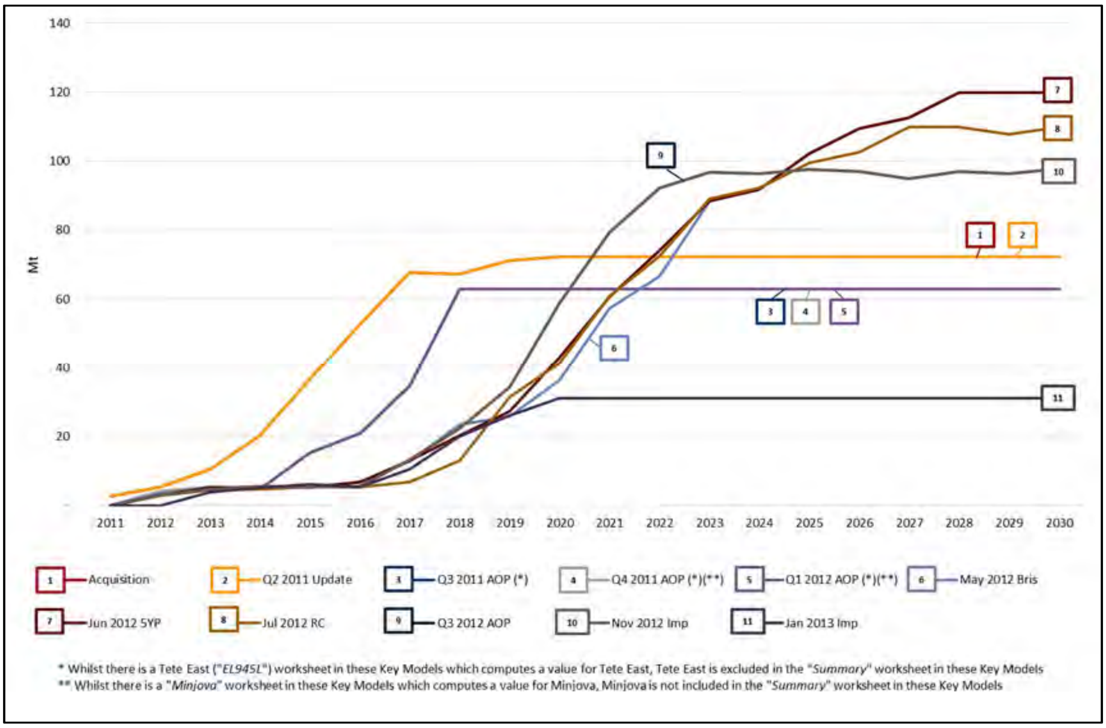
Ramp-up

10.3.3 Ramp-up is the speed at which each mine is brought online and the rate at which production increases[384].

10.3.4 In Figure 10G below, I summarise the ROM Ramp-up production in each of the Key Models:

[383] The Drewe Model/the Key Models
[384] Mr Morris deposition transcript, dated 8 November 2018, page 51

Figure 10G: The ROM Ramp-up production assumptions in the Key Models (100% Share)[385]



10.3.5 It is evident from Figure 10G (and adopting the number referencing of the Key Models in Figure 10G) that:

(a) the Acquisition Model 1 and Q2 2011 Update Model 2 assume a Ramp-up period (of nine years), with production commencing in 2011 and reaching its steady-state of 72Mtpa by 2020;

(b) the Q3 2011 AOP Model 3 to November 2012 Impairment Model 10 have broadly similar Ramp-up profiles which are deferred compared with the Acquisition Model. The Q3 2012 AOP Model 9 and November 2012 Impairment Model 10 both have a quicker Ramp-up than these other Key Models; and

(c) the January 2013 Impairment Model 11 assumes again a deferred Ramp-up, but steady-state is reached earlier than the Key Models referred to in (b) above.

[385] The Drewe Model/the Key Models

My assessment of the reasonableness of the annual production assumptions in the Key Models

The annual production assumptions in the Acquisition Model

10.3.6 The "*Project Ralph Technical Due Diligence*" report prepared by Rio Tinto Technology and Innovation, dated 7, January 2011 ("**RT T&I Technical DD Report**")[386] is consistent with the annual production assumptions in the Acquisition Model for Benga and Zambeze. The RT T&I Technical DD Report sets out that:

(a) "*Riversdale indicate their intention to expand Benga to 20Mt/y Run-of-Mine from the currently approved 10Mt/y production rate. This step is supported by T&I; however further expansion or extension of operating life is problematic, largely due to geological features such as major faulting and seam deterioration*". The annual ROM production capacity for Benga in the Acquisition Model (of 21.2Mtpa) is thus broadly consistent with the RT T&I Technical DD Report; and

(b) "*Zambeze is contemplated at a notional 45Mt/y ROM rate in the recently completed Riversdale pre-feasibility study. Although Riversdale have publically signalled that the resource could support production at 90Mt/y ROM, T&I are uncomfortable with the complexity of the operation at this scale*". The annual ROM production capacity assumption for Zambeze in the Acquisition Model (of 45.0Mtpa) is thus consistent with the RT T&I Technical DD Report.

10.3.7 However, in the Post Transaction Period, a number of issues appear to have been identified which called into question these annual production assumptions. These issues include constraints over Ramp-up and / or annual production capacity as a result of (i) mining related issues and (ii) Coal Chain infrastructure related issues. The Project Mercury team described the Ramp-up assumed in the Acquisition Model as "*breath-taking in … speed and scale, demonstrating either a lack of knowledge or disregard for operational reality*"[387].

[386] RT T&I Technical DD Report [RT_SEC_00057889 to RT_SEC_00058070]

[387] Paper titled "*Project Mercury - Executive Summary*", dated 12 April 2013, page 5 [RT_00001065 to RT_00001091]

Mining related issues: the available workforce and mining equipment

10.3.8 By September 2011, certain issues regarding the feasibility of the annual production capacity assumptions in the Acquisition Model as a result of the availability of the workforce and the inability to acquire sufficient mining equipment appear to have been identified. Mr Dupree explains that:

"[t]*he heavy mining equipment, the manufacturers at that time were having a queue. In other words, their production was sold up front. So there was only so much capacity for manufacturer heavy mining equipment in the world, and that was being exceeded*"[388].

10.3.9 Mr Dupree stated that the Ramp-up assumed in the Acquisition Model was "*aggressive*" and "*could not be achieved*" due to the availability of heavy mining equipment ("**HME**")[389].

10.3.10 I have therefore assumed that the Ramp-up profile included in the Acquisition Model was not realistic. However, the issues were not reflected in the Key Models until the May 2012 Brisbane Model. An email from Mr Finlayson to Melissa Harris, Principal Advisor Human Resources – Energy, RTS ("**Ms Harris**") on 15 June 2012 explains that:

"*Cracks in the model started to appear as far back as September. First, mining studies on the Zambeze project suggested that the 43Mtpa ROM case was most likely technically unfeasible. Volumes to be moved and mining equipment required were both simply far too large. The impact of this realisation was to reduce peak production that could be achieved from the Zambeze mine*"[390].

10.3.11 In specific reference to Zambeze, the Final May 2012 Brisbane Presentation explained that:

"*Mining and processing studies since acquisition show initial concept of 43Mtpa ROM is not feasible. Focus is now on 30Mtpa development*"[391].

[388] Mr Dupree deposition transcript, dated 20 February 2019, pages 14 and 15
[389] Mr Dupree deposition transcript, dated 20 February 2019, pages 45 and 46
[390] Email from Mr Finlayson to Ms Harris, dated 15 June 2012, subject "*RTCM Leadership Meeting*" [RT_00265031 to RT_00265035]
[391] Final May 2012 Brisbane Presentation [RT_00278107 to RT_00278133]

10.3.12 Mr Dupree explains that 43Mtpa ROM for Zambeze was not possible due to "*a problem with pit phasing and scheduling*" meaning "[t]*here weren't sufficient operating areas for the shovels required to make 43*[Mtpa]"[392].

10.3.13 These updated annual ROM steady-state assumptions were reflected in the Zambeze assumptions in the May 2012 Brisbane Model to the November 2012 Impairment Model.

The available Coal Chain infrastructure

10.3.14 In relation to the RTCM Assets, the Deloitte PPA Report sets out that:

"*The* [Acquisition] *model was prepared based on… an assumption that the Coal Projects will have sufficient access to rail and port infrastructure so as not to impede production*"[393].

10.3.15 Therefore, it was assumed that the Coal Chain infrastructure would not constrain the volumes of saleable production – all of the saleable production from the mines would be able to be transported to the port for export. This is a critical assumption.

10.3.16 An email dated 17 October 2011 from Mr Finlayson, RTE, to Lebo Ndou, Advisor Public Relations – Southern, C&ER ("**Mr Ndou**") explains that this assumption was known to be incorrect:

"*Acquisition model made some bold assumptions about future availability of infrastructure capacity particularly around timing and volume of barging – assumptions that 10 months later we believe to be incorrect*".

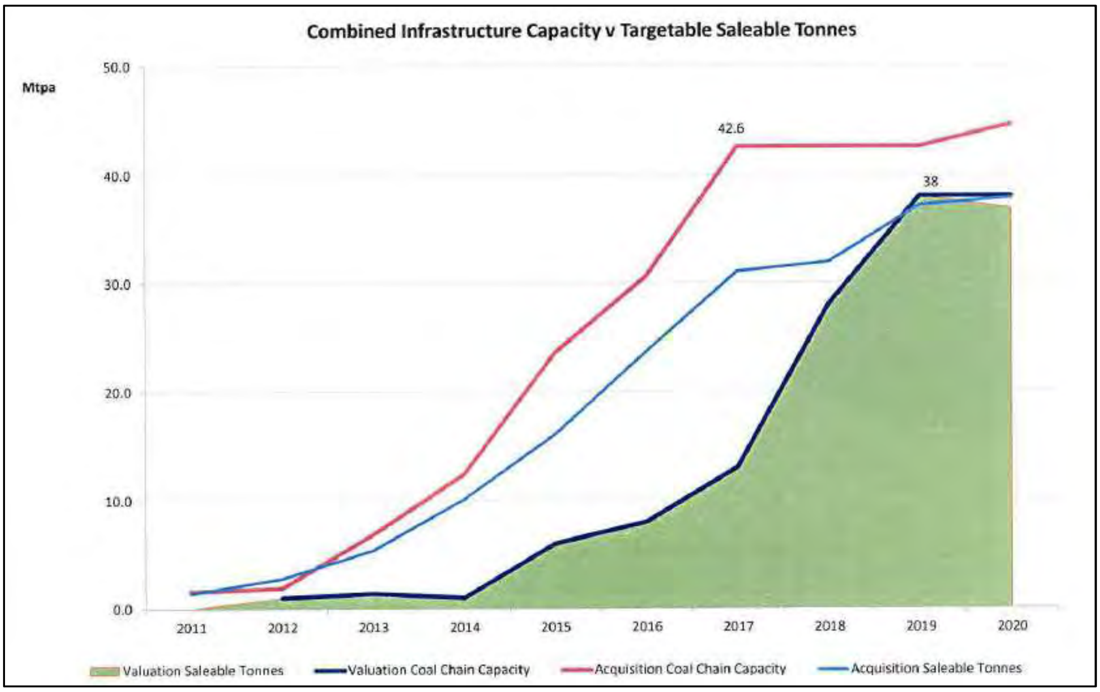
"[The Ramp-up assumed in the Acquisition Model was] *very aggressive but more realistic ramp-up of production relying heavily on the greenfield rail & port options delivering the same output in 2020 as the acquisition model*"[394].

10.3.17 Mr Finlayson's view that the Ramp-up assumptions in the Acquisition Model were "*very aggressive*" is consistent with a presentation titled "*Rio Tinto Coal Mozambique Plan Presentation – RTE Plan Review Committee*", dated October 2011 ("**RTCM Oct 2011 PRC**

[392] Mr Dupree deposition transcript, dated 20 February 2019, pages 71 and 72
[393] Deloitte PPA Report, page 19 [RT_00180990 to RT_00181048]
[394] Email from Mr Finlayson to Mr Ndou, dated 17 October 2011, subject "*pls print*" [RT_00264440 to RT_00264444]

Presentation")[395]. This presentation shows graphically that the Ramp-up of saleable production would be constrained by the Coal Chain infrastructure:

Figure 10H: RTCM October 2011 PRC Presentation extract[396]



10.3.18 Further, in the RTCM Oct 2011 PRC Presentation, the Coal Chain capacity was identified as follows:

Table 10K: Coal Chain capacity Ramp-up in the RTCM Oct 2011 PRC Presentation[397]

	2012	2013	2014	2015	2016	2017	2018	2019	2020
	MT	*MT*	*MT*	*MT*	*MT*	*MT*	*MT*	*MT*	*MT*
Sena Railway	1.0	1.5	1.0	3.0	3.0	3.0	3.0	3.0	3.0
Barging	-	-	-	3.0	5.0	10.0	10.0	10.0	10.0
Greenfield Railway	-	-	-	-	-	-	15.0	25.0	25.0
Total	**1.0**	**1.5**	**1.0**	**6.0**	**8.0**	**13.0**	**28.0**	**38.0**	**38.0**

395 Rio Tinto Coal Mozambique Plan Presentation, dated October 2011 [RT_00023770 to RT_00023823]
396 Rio Tinto Coal Mozambique Plan Presentation, dated October 2011, slide 34 [RT_00023770 to RT_00023823]
397 Rio Tinto Coal Mozambique Plan Presentation, dated October 2011, slide 36 [RT_00023770 to RT_00023823]

10.3.19 In the table below, I compare this Coal Chain capacity with the saleable production assumed in the Q4 2011 AOP Model:

Table 10L: Coal Chain capacity in the RTCM Oct 2011 PRC Presentation compared with the Q4 2011 AOP Model[398]

	2012	2013	2014	2015	2016	2017	2018	2019	2020
	MT	*MT*	*MT*	*MT*	*MT*	*MT*	*MT*	*MT*	*MT*
Coal Chain Capacity	1.0	1.5	1.0	6.0	8.0	13.0	28.0	38.0	38.0
Saleable production	1.8	2.4	1.4	5.9	7.6	11.7	22.6	23.8	23.8
Difference	**(0.8)**	**(0.9)**	**(0.4)**	**0.1**	**0.4**	**1.3**	**5.4**	**14.2**	**14.2**

10.3.20 As can be seen in Table 10L, in the first three years of production, the total saleable production in the Q4 2011 AOP Model was greater than the available Coal Chain capacity set out in the RTCM Oct 2011 PRC Presentation. The Ramp-up of saleable production assumed in the Q4 2011 AOP Model therefore appears unreasonable.

10.3.21 Further and importantly, as can be seen in Table 10K, in 2018 to 2020 the Coal Chain in the RTCM Oct 2011 PRC Presentation includes Greenfield Railway. The Coal Chain infrastructure only had capacity to transport the saleable production in the Q4 2011 AOP Model because of the inclusion of the Greenfield Railway (meaning that, without the Greenfield Railway, there would not be sufficient Coal Chain capacity to transport the saleable production). Therefore, the Greenfield Railway was essential to the Coal Chain infrastructure. However, the Q4 2011 AOP Model does not appear to include any costs (Capital Costs nor Operating Costs) for the Greenfield Railway[399].

<u>Other annual production considerations</u>

10.3.22 In an email from David Lawrence to Mike Jolley, Chief Financial Officer, RTCM ("**Mr Jolley**"), dated 28 February 2012, it is explained that, in relation to the annual ROM production capacity of Benga:

[398] Rio Tinto Coal Mozambique Plan Presentation, dated October 2011, slide 36 [RT_00023770 to RT_00023823] and Q4 2011 AOP Model [RT_00336177]
[399] See Section 11.4

"*CP Reserve view is 10.6mtpa at steady state*";

"*Current official view is 16mtpa ROM at steady state*"; and

"*Aspirational view is 21.2Mtpa ROM if we get Vale boundary coal as well*"[400].

10.3.23 The Q4 2011 AOP and Q1 2012 AOP Model assumed an annual ROM steady-state for Benga of 21.2Mtpa. Therefore, these models appear to assume Rio Tinto's "*Aspirational view*" of the Benga annual ROM steady-state production, rather than the "*Current official view*". The "*Current official view*" was then reflected in the May 2012 Brisbane Model

10.4 Conclusion on the reasonableness of the physical assumptions

10.4.1 Considering the production assumptions in the light of (i) Rio Tinto's contemporaneous valuation guidelines; (ii) the requirements of a FVLCS assessment undertaken in accordance with IFRS and Rio Tinto's Controller's Manual; and (iii) the available contemporaneous evidence of the facts and circumstances that existed in the Post Transaction Period, my conclusions are as follows:

(a) the LOM production assumptions assumed in the Key Models in relation to:

(i) Benga were reasonable, with the exception of the Key Models from the May 2012 Brisbane Model to the Q3 2012 AOP Model, which by reference to Rio Tinto's Apparent Conversion Ratios do not appear reasonable;

(ii) Zambeze were unreasonable by reference to Rio Tinto's Apparent Conversion Ratios in a number of Key Models. Further, a risk adjustment was required to be applied to the computed NPV of Zambeze in an assessment of FVLCS in the context of an impairment test;

(iii) Tete East were unreasonable in a number of Key Models because:

[400] Email from David Lawrence to Mr Jolley, dated 28 February 2012, subject "*FW: Benga 5% Sell Down*" [RT_00169390 to RT_00169392]

- PEG required that, in a Plan NPV, "[t]*he volume of ore should not include all the upside or blue sky that can be envisaged, although this potential can be shown as a sensitivity if appropriate*"[401]; and

- even if it was appropriate to include this production in a CEFC (which would have been contrary to the requirements of PEG), when computing a FVLCS Rio Tinto's 2011 Annual Financial Statements explain that "*…non-reserve material is only included where there is a high degree of confidence in its economic extraction*"[402].

(iv) Minjova were unreasonable in a number of Key Models because:

- they assumed that Minjova would produce HCC but Rio Tinto appears to have identified that this was unlikely;

- they assumed volumes of Thermal Coal that was significantly greater than the volumes set out in information that appears to have been available to Rio Tinto;

- PEG required that, in a Plan NPV, "[t]*he volume of ore should not include all the upside or blue sky that can be envisaged, although this potential can be shown as a sensitivity if appropriate*"[403]; and

- even if it was appropriate to include this production in a CEFC (which would have been contrary to the requirements of PEG), when computing a FVLCS Rio Tinto's 2011 Annual Financial Statements explain that "*…non-reserve material is only included where there is a high degree of confidence in its economic extraction*"[404].

(b) the annual production assumptions in certain of the Key Models were unreasonable because they did not reflect the apparent facts and circumstances relating to:

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[401] PEG, Volume 2, page 29, Section 7.2.1 [RT_SEC_00115484 to RT_SEC_00115541]
[402] Rio Tinto's 2011 Annual Financial Statements, page 143; Rio Tinto's 2012 Annual Financial Statements, page 151
[403] PEG, Volume 2, page 29, Section 7.2.1 [RT_SEC_00115484 to RT_SEC_00115541]
[404] Rio Tinto's 2011 Annual Financial Statements, page 143; Rio Tinto's 2012 Annual Financial Statements, page 152

(i) mining related issues (the availability of the workforce and the inability to acquire sufficient mining equipment);

(ii) the Coal Chain infrastructure which, contrary to the assumption in the Acquisition Model, constrained the Ramp-up of the saleable production. The annual production also relied upon the Greenfield Railway but costs for the Greenfield Railway were not included in certain of the Key Models; and

(iii) the annual ROM steady-state production for Benga included in certain of the Key Models was Rio Tinto's "*Aspirational view*" rather than the "*Current official view*".

11 Coal Chain assumptions

11.1 Introduction

11.1.1 "Coal Chain" refers to the logistics options for the transport of coal from the relevant mine sites to the coast for export.

11.1.2 Prior to the Transaction, Rio Tinto had identified four potential Coal Chain options[405]:

(a) the "**Sena Railway**", being the railway from Sena to the Port of Beira. This was an existing 570km railway line which had a capacity of 6Mtpa, of which RTCM was expected to have access to 2Mtpa when production at Benga commenced. The GoM was undergoing an expansion program to increase the capacity of the Port of Beira;

(b) "**Barging**" of product down the Zambezi River to Chinde where an offshore platform could be constructed, with an initial capacity of 18Mtpa. Studies suggested that Chinde could be expanded to handle 60Mtpa;

(c) the "**Nacala Railway**", being a potential 900km rail link to Nacala, one of the deepest ports in southern Africa capable of handling large vessels; and

(d) "**Greenfield Railway**", being a greenfield rail and port solution[406].

11.1.3 The "Coal Chain matrix" is the combination of these options assumed by Rio Tinto in each of the Key Models.

11.1.4 Importantly, the choice of Coal Chain can impact the computed NPV in a number of ways. For example:

(a) different Coal Chain options could impact the costs included in the DCF model. This includes both:

(i) Operating Costs (for example, the fee to use the local railway); and

[405] Deloitte PPA Report, pages 12 and 13 [RT_00180990 to RT_00181048] and Rio Tinto Coal Mozambique Plan Presentation, dated October 2011 [RT_00023770 to RT_00023823]

[406] Ms Newell explains that "*A greenfield project or a greenfield railway is a construction of a project or an asset that is from nothing*" (Ms Newell deposition transcript, dated 27 September 2018, page 52)

(ii) Capital Costs (for example, the cost of constructing a Greenfield Coal Chain solution, such as a new railway). These Capital Costs may be able to be partly off-set by selling spare capacity (which would therefore represent an additional income stream for Rio Tinto); and

(b) different Coal Chain options may constrain the quantity of saleable production that is able to be transported to the coast for export. If the Coal Chain does constrain the saleable production (because the Coal Chain option cannot transport all of the saleable production from the mines), this would impact upon the timing of revenue. As I explain in paragraph 4.4.10, the deferral of revenue in a DCF model results in a decrease in the computed NPV.

11.1.5 The Coal Chain assumptions are, in the context my instructions, the most significant factor which led to the impairment of the RTCM Assets. Consistent with my conclusions, the Project Mercury review team explained that a number of significant issues in relation to the Coal Chain were included in the "*Base case valuation summary*" presented to the December 2010 Board Meeting:

"*Was Infrastructure a potential deal breaker? Yes, the assumption that unlimited barging could be achieved with a fast ramp up and very low, fully variable rates was critical to the determination of value of Riversdale. The subsequent rejection of barging by the Government of Mozambique, and the requirement to utilise rail and port alternatives (all of which are materially more expensive than the assumed barging costs) were contributors to the January 2013 impairment of the RTCM business. If a scenario without barging was modelled in the original analysis, it is quite likely this acquisition would not have been completed in the manner in which it was.*"[407]

"*The due diligence effort was skewed towards the mining studies. Little was done on the Sena-Beira railway, and the RTM report was limited to barging costs, the river mouth and the port at Chinde and did not cover upriver navigability or political approvals. No one flew the river and rail options such as Nacala were not evaluated*"[408].

[407] Paper titled "*Project Mercury - Infrastructure*", undated, page 1 [RT_00003494 to RT_00003518]
[408] Paper titled "*Project Mercury - Commercial*", undated, page 9 [RT_00003749 to RT_00003778]

11.1.6 In this context, in this Section I identify the Coal Chain assumptions in the Key Models and I explain the impact of changes in the Coal Chain assumptions on the computed NPV. I also consider whether these Coal Chain assumptions appear reasonable in the light of:

(a) Rio Tinto's contemporaneous valuation guidelines, including PEG;

(b) the requirements of a FVLCS assessment undertaken in accordance with IFRS and Rio Tinto's Controller's Manual; and

(c) the available contemporaneous evidence of the facts and circumstances that existed in the Post Transaction Period.

11.1.7 The Coal Chain assumptions I have considered comprise:

(a) the Coal Chain matrix assumed in the Key Models (**Section 11.2**). I conclude that the Coal Chain matrix assumed in certain of the Key Models does not appear reasonable because it did not reflect the known requirement for a Greenfield Railway solution as a result of identified issues with Barging and the capacity constraints of the Sena Railway;

(b) the Operating Cost of the Coal Chain (**Section 11.3**) and the Capital Cost of the Coal Chain (**Section 11.4**) in the Key Models. I conclude that these Operating Cost and Capital Cost assumptions in certain of the Key Models do not appear reasonable because they did not reflect the facts and circumstances (including understating the likely Operating Costs and/or failing to include the Capital Costs of the Sena Railway and/or Greenfield Railway despite it being apparent that these costs would be incurred); and

(c) in the Key Models where a Greenfield Railway was included, the sale of its spare transport capacity (**Section 11.5**). I conclude that this assumption was not reasonable given that Rio Tinto do not appear to have performed an analysis to identify potential purchasers or to assess the reasonableness of the sale price. This is a critical assumption because, without the revenue from this sale of spare capacity, Rio Tinto would not be able to cover the significant cost of the construction of the Greenfield Railway, meaning that it would require an alternative higher cost and lower volume Coal Chain solution.

11.2 The Coal Chain matrix

11.2.1 In this Section I consider the Coal Chain matrix assumed in the Key Models:

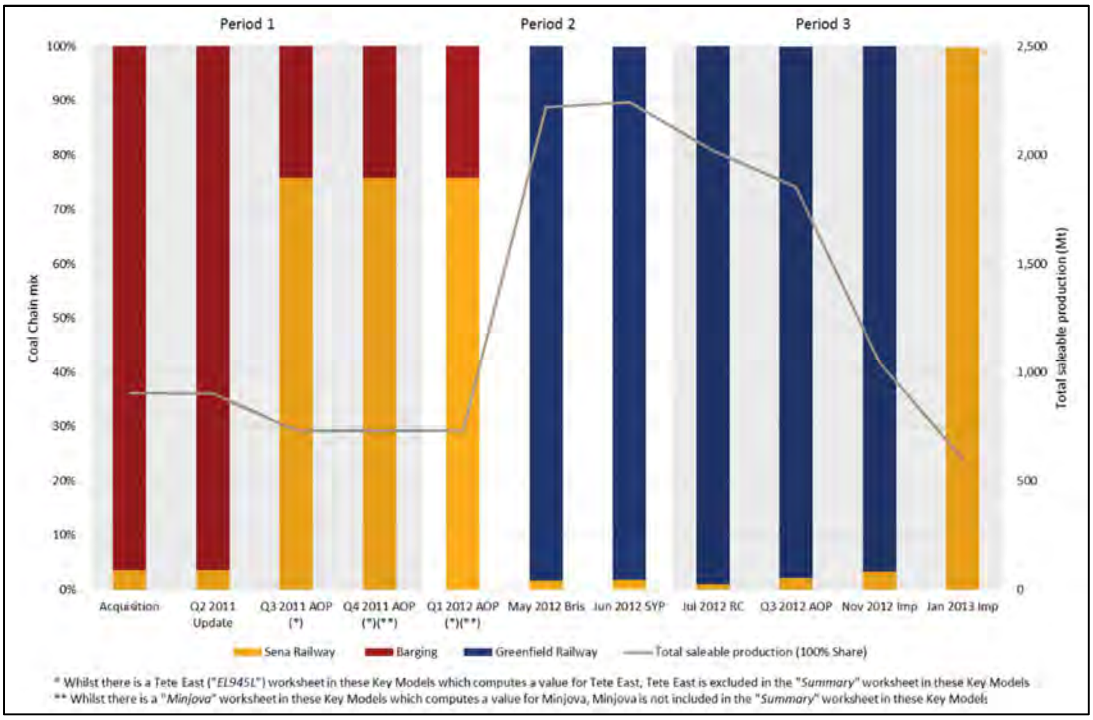
(a) first, I identify the Coal Chain matrix assumed in the Key Models (paragraphs 11.2.2 to 11.2.3); and

(b) I then consider the reasonableness of these Coal Chain matrix assumptions (paragraphs 11.2.4 to 11.2.17).

The Coal Chain matrix assumed in the Key Models

11.2.2 In the graph below I summarise the Coal Chain matrix assumed in each of the Key Models, together with the total saleable production.

Figure 11A: The Coal Chain matrix assumed in the Key Models (100% Share)[409]



11.2.3 In **Appendix H**, I provide a series of charts which analyse the Coal Chain matrix in the Key Models in each period. Together with Figure 11A above, these charts demonstrate that:

[409] The Drewe Model/the Key Models

(a) the Coal Chain was initially principally reliant upon Barging;

(b) by the Q3 2011 AOP Model, the Sena Railway had replaced Barging as the principal method of transport;

(c) in the May 2012 Brisbane Model, the Greenfield Railway was included in a Key model for the first time. This coincided with a significant increase in the expected volumes of saleable production; and

(d) until the January 2013 Impairment Model, all of the Key Models after the May 2012 Brisbane Model relied upon a Greenfield Railway. The January 2013 Impairment Model was based only on the Sena Railway[410].

My assessment of the reasonableness of the Coal Chain matrix assumed in the Key Models

Barging

11.2.4 It can be seen from Figure 11A that the Acquisition Model assumed that almost all of the saleable coal would be transported via Barging; the Sena Railway was expected to be used in only the first few years whilst the infrastructure required for Barging was constructed.

11.2.5 However, by the Q3 2011 AOP Model, Barging was assumed to provide only 24.3% of the required Coal Chain in the model and from this point where Barging was assumed in the Key Models, it appears to have been limited to 10Mtpa. I have assumed for the purposes of my report that by the end of 2011, Rio Tinto was expecting that only 10Mtpa of saleable production (circa a third of the total saleable production in the Acquisition model) could be transported via Barging. My assumption is consistent with the available evidence[411].

[410] A negligible amount was also assumed to be transported by "*Road Train*"

[411] In an email to Mr Ritchie, dated 25 November 2011, Mr Finlayson explained that a maximum capacity of 10Mtpa was reflected in the ESIA (An ESIA is an Environmental and Social Impact Assessment which is submitted to the GoM) submitted in September 2011, compared with the previously assumed capacity of 30Mtpa: "*The acquisition model assumed that barging came on stream in 2015 and ramped up from 11Mtpa in 2015 to 30Mtpa by 2017. The assumption in the 2012-2016 Plan is that barging comes on in 2015 and that a ramp up to 10Mtpa by 2017 is achieved. This is the expected maximum throughput if we follow the model outlined in the barging ESIA. As indicated in an email from Helen, "I believe getting it above that will be extremely challenging but we are proposing a study to consider.*"" (Email from Mr Finlayson to Mr Ritchie (cc: Mr Coulter, Simon Wensley, Chief Executive, RTHQ ("**Mr Wensley**"), Mr Jolley and Mr Woodley), dated 25 November 2011, subject "*RTCM business valuation*" [RT_00237829 to RT_00237833]). Further Ms Newell explains that 10Mtpa

11.2.6 Rio Tinto then identified that its Barging proposal had been rejected by the GoM. I have assumed for the purposes of my report that this rejection took place at the end of 2011 / early 2012. My assumption is consistent with the available evidence[412]. Despite this apparent rejection, the Q4 2011 AOP Model and the Q1 2012 AOP Model continued to include Barging and it appears that Rio Tinto continued to pursue Barging as an option into early 2012[413].

11.2.7 For the purposes of my report, I have assumed that in Period 2, Rio Tinto abandoned its barging proposal. My assumption is consistent with the available evidence[414]. From the May 2012 Brisbane Model onward, Barging was no longer included in the Key Models.

(not 30Mtpa) was the working assumption for barging at that time and that there were "*operational constraints that would have made it, we believe, unreliable to look to move more than about 10, using that operating model*" (Ms Newell deposition transcript, dated 27 September 2018, pages 151 to 152 and 157).

[412] For example, (i) the notes from a meeting between Rio Tinto and the Mozambique Ministry of Environment on 30 November 2011 set out that: "*Most of the reviews were not favourable to barging on the Zambezi River because the negative environmental impacts were considered greater than the economic benefits* […] *The final step was to take it to CONDES council, chaired by the Prime Minister, and the decision made was that the Barging Project SHOULD NOT PROCEED.*" (Note of meeting with the Ministry of Environment, dated 30 November 2011, Maputo, pages 1 and 2 [RT_00074947 to RT_00074949]); (ii) a report titled "*Mozambique & RSA Coal*", dated November 2011, explained that: "*The Environment Ministry indicated verbally on November 30 that the Zambezi River barging ESIA had been rejected* […] *A formal letter of rejection will likely be withheld until after the meeting on December 9 between the Prime Minister and the Chief Executive of Rio Tinto*" (Rio Tinto document titled "*Mozambique & RSA Coal*", dated November 2011, page 2 [RT_00188736 to RT_00188739]); (iii) an email from Eric Finlayson (Managing Director of RTCM) to Matt Coulter (Director of Energy Business Development at RTE), dated 7 December 2011, with the subject "*RTCM business valuation*" explained that: "*We were informed on November 30 by the Ministry of Environment that the barging ESIA had been rejected* […] *there was always the risk that the cost, environmental or political risks would unwind the barging option. The ESIA also never envisaged 30Mtpa. So the greenfield rail & port option is – and always was – more than just a preference of myself, Helen or anyone else*" (Email from Mr Finlayson to Mr Coulter, dated 7 December 2011, subject "*RE: RTCM business valuation*" [RT_00237829 to RT_00237833]); and (iv) a January 2013 RTCM Coal Chain Position Paper stated: "*4Q, 2011, Rejection of Riversdale Barging ESIA and subsequent instruction from President Guebuza's office to cease any fieldwork associated with barging coal down the Zambezi River* […] *and strong pressure to withdraw barging from our Investment Proposal… In November 2011, RTCM was advised bluntly that the inclusion of barging in any proposal to GoM would result in the entire proposal being rejected and our reputation materially damaged within Mozambique*" (RTCM Coal Chain Position Paper – January 2013, pages 1 and 7 [RT_00079540 to RT_00079546])

[413] For example, Rio Tinto continued to seek discussions with the GoM in this regard (Mozambique & RSA Coal, Monthly Report for February 2012, page 3 [RT_00240375 to RT_00240377])

[414] For example, (i) on 18 April 2012, Rio Tinto presented to an inter-ministerial Investment Council but was informed that Barging would remain "*off the agenda*" (Email from Mr Finlayson to Ms Harris, dated 15 June 2012, subject "RTCM Leadership Meeting" [RT_00265031 to RT_00265035]); (ii) an email sent by Mr Woodley to Mr Ritchie on 20 April 2012 in respect of this meeting set out that: "*The key messages were very consistent and as follows - Barging on the Zambeze is most unlikely to occur under the current Government. The Minister for Planning mentioned that the issue was due to political matters with Malawi. - Barging studies should not proceed. The Minister for Planning stated that progressing with barging studies would negatively impact relationships with the Government of Mozambique.*" (Email from Mr Woodley to Mr Ritchie (cc: Mr Finlayson and Helen Newell, Vice President of Infrastructure, RTE ("**Ms Newell**")), dated 20 April 2012, subject "*Update on PPP*" [RT_SEC_00084910 to RT_SEC_00084914]); (iii) Mr Albanese's Chief Executive's Report for a Board Meeting on 9 May 2012 stated that "*Expanded lobbying is planned following notification by the Government that*

The Greenfield Railway

11.2.8 For the purposes of my report, I have assumed that Rio Tinto was aware (by the end of 2011) that the Greenfield Railway would be required as part of the Coal Chain (initially, as part of a multi-corridor approach). My assumption is consistent with the available evidence[415]. On this basis, I would expect the costs of constructing and operating a Greenfield Railway to be

barging is not a priority and that RTCM must cease all barging trial work. This is due to the President's personal history with Malawi" (Rio Tinto Board Paper, Chief Executive Report, A paper from Mr Albanese, page 5 [RT_00196501 to RT_00196512]); (iv) an email from Delwin Witthoft, Group Deputy Controller, RTHQ ("**Mr Witthoft**") to Mark Shannon, Head of Investor Relations, RTHQ ("**Mr Shannon**") on 29 May 2012 explained that "*the barging option underlying the acquisition values has been completely abandoned (for now) after strong feedback from the government (i.e. more than one minister speaking out of turn). The clear message to Rio was to abandon the barging idea or lose the right to mine in Mozambique*" (Email from Mr Witthoft to Mr Shannon, dated 29 May 2012, subject "*RE: Riversdale update*" [RT_00472407 to RT_00472410]); (v) an email from Ms Newell to Mr Finlayson on 5 June 2012 set out that "*Barging study closed due to lack of political support from Govt of Mozambique, and Rio Tinto policy to reduce study costs*" (Email from Ms Newell to Mr Finlayson, dated 5 June 2012, subject "*FW: CE Report to the Board - input required by no later than Tuesday 5 June*" [RT_SEC_00085799 to RT_SEC_00085802]); and (vi) the Project Mercury team explained that "*By the second quarter of 2012, RTCM had concluded that it needed to develop a revised expansion programme in the light of the government's formal rejection of barging in April, 2012*" (Paper titled "*Project Mercury – Impairment*", undated, page 2 [RT_SEC_00207568 to RT_SEC_00207574])

[415] For example, (i) the RTCM Oct 2011 PRC Presentation set out that: "*Greenfield solutions will be required to unlock the full coal production potential of the Moatize Basin… A scalable solution owned and operated by RTCM will target 25Mtpa of coking coal sales by 2020 and further production growth beyond*" (Rio Tinto Coal Mozambique, Plan Presentation, RTE Plan Review Committee, October 2011, pages 3 and 6 [RT_00023770 to RT_00023823]); (ii) an email to Ms Newell, dated 23 August 2011, refers to a "*rail and port Greenfield option*" (Email from Alastair Lax, Logistics, Riversdale ("**Mr Lax**") to Ms Newell (cc: Mr Woodley, Mr Finlayson and others), dated 23 August 2011, subject "*Govt Transport Strategy Summary and Social and Economic Review*" [RT_SEC_00069056 to RT_SEC_00069062]); (iii) Mr Finlayson summarised Rio Tinto's progress in relation to the Greenfield Railway in an email to Mr Ritchie, dated 28 October 2011: "*Rio Tinto is investigating two green field options for additional coal export corridors.* […] *The second and more important involves new rail and port construction with the port located near Quelimane. The distance to port along this new rail would be comparable to the current Sena-Beira line*" (Email from Mr Finlayson to Mr Ritchie, dated 28 October 2011, no subject [RT_00236733 to RT_00236734]); (iv) Mr Finlayson in an email to Mr Jolley, dated 17 November 2011, states that: "*The RTCM business valuation assumes that a greenfield rail & port solution comes on stream in 2018 and ramps up to 50Mtpa by 2022*" (Email from Mr Finlayson to Mr Jolley, dated 17 November 2011, subject "*Can you assist with the highlights*?" [RT_00264574 to RT_00264577]); (v) Mr Finlayson in an email to Mr Ritchie, dated 6 December 2011, states that: "*With the barging ESIA being verbally rejected by the Government on November 30 (with a stay of execution until Tom meets the PM), we don't have a business without the greenfield solution*" (Email from Mr Finlayson to Mr Ritchie, dated 6 December 2011, subject "*Draft letter to Prime Minister*" [RT_00237803 to RT_00237804]); and (vi) in December 2011, a Greenfield Railway proposal was presented to the Permanent Secretary of the Ministry of Planning and Development ("**MPD**") and appears to have received positive feedback: "*Mr. Vala showed genuine interest in understanding the project, the various transport options in the country, different cost effective options for different coal qualities etc.* [...] *Mr. Vala phoned Alima yesterday, to give her feedback, which is remarkable. Mr. Vala informed that the proposal was being received with interest by Government, and that he already had a first meeting with CPI on this. MPD will soon also work with other ministries, mainly to analyze the project and prepare Government's opinion from a technical perspective.*" (Email from Emmy Bosten, General Manager – External Affairs, Riversdale ("**Ms Bosten**") to Mr Finlayson, Ms Newell, Mr Woodley and others, dated 24 December 2011, subject "*Meeting Permanent Secretary Ministry of Planning and Development (MPD)*" [RT_00340314 to RT_00340316])

included in the Q4 2011 AOP Model and Q1 2012 AOP Model. As set out in Section 10.3, the volumes of saleable production in these two models was reliant upon a Coal Chain which included the Greenfield Railway. The Greenfield Railway does not appear to be included in any of the Key Models prior to the May 2012 Brisbane Model.

<u>The Sena Railway</u>

11.2.9 In the Acquisition Model, it was assumed that the Sena Railway could provide 12.6Mtpa of Coal Chain capacity to Rio Tinto from 2015, rising to 14.6 Mt in 2020. For the purposes of my report, I have assumed that by the end of Period 1, Rio Tinto had identified that the capacity of the Sena Railway available to Rio Tinto was only going to be 6Mtpa. My assumption is consistent with the available evidence[416]. However, the Q3 2011 AOP Model, Q4 2011 AOP Model and Q1 2012 AOP Model all assume saleable coal being transported on the Sena Railway up to a maximum amount of 17.1Mtpa (which is higher than the assumed capacity at Acquisition and indeed in the "*Logistics*" worksheet of those Key Models).

11.2.10 Further, an email from Chris Webb, Business Analyst – Future Corridors, RTE ("**Mr Webb**") to Ms Newell dated 4 May 2012 explains how Rio Tinto's assumptions changed in relation to the Sena Railway:

"*A very steep ramp-up on Sena Beira in **<u>bid case</u>*** [Acquisition Model] ***<u>which is significantly more aggressive than that now contemplated</u>*** [...] *10mt max capacity by 2014 on Sena Beira would require a 30mtpa+ system (assuming 32% RTCM). The bid case relies on the First Class Partnership* [external consultants] *work which states that 30mtpa is possible with significant track upgrades and loop lengthening, and perhaps the need for higher axle loads* [...] ***<u>Current position is that Beira port capacity is clearly a risk above 8-9mtpa system</u>***

[416] For example, (i) a Rio Tinto presentation dated 5 August 2011 explained that the "*Sena / Beira rail corridor will be constrained to 5-6Mtpa without further upgrades*" (Rio Tinto Projects in Mozambique, MIREM Co-ordinating Council Meeting, dated 5 August 2011, slide 9 [RT_00020650 to RT_00020662]); and (ii) an email from Mr Finlayson to Mr Jolley, dated 17 November 2011, set out that: "*The acquisition model assumed 6Mtpa of rail & port capacity in 2012 (RTCM share 1.9Mtpa) with the RTCM share rising to 12.6Mtpa by 2014. The current assumption is that a capacity upgrade from 6Mtpa to 19Mtpa by 2014 proceeds as recently announced by CFM; that there will be intense competition from Vale, Jindal, ENRC and others for the 13Mtpa of extra capacity; and that the RTCM share of the 19Mtpa will be 3Mtpa. Even if there were no other companies competing for capacity and the current 68:32 capacity split with Vale was preserved, the RTCM share of 19Mtpa capacity would be only 6Mtpa*" (Email from Mr Finlayson to Mr Jolley, dated 17 November 2011, subject "*Can you assist with the highlights?*" [RT_00264574 to RT_00264577])

capacity. I am not sure to what extent that was acknowledged in the bid analysis" [emphasis added][417].

11.2.11 In the May 2012 Brisbane Model and June 2012 5YP Model, the assumed capacity of the Sena Railway available to RTCM was significantly reduced to 5Mtpa steady state. The reference to 30Mtpa being possible is addressed by the Project Mercury review team as follows "*Material seen in the VDR and Riversdale documents propose expansions of Sena Beira system to 20MTPA, but not the 30MTPA implied by this statement*"[418].

Conclusion on the Coal Chain matrix

11.2.12 Whilst the Acquisition Model relied upon Barging, the Project Mercury review team stated that:

"*Only assuming a central case where barging was fully scalable, low cost and almost fully variable mode of transport was misleading with such a low level of certainty*"[419].

11.2.13 Barging as a low cost high volume Coal Chain solution was however critical to RTCM. The Project Mercury review team noted that:

"*Rail scenarios based on the rail costs assumed in the AVT report would have shown that Zambeze and* [Tete East] *were uneconomic without barging being feasible and would have set alarm bells ringing*"[420].

11.2.14 Therefore, without Barging, both Zambeze and Tete East were identified as being uneconomic:

"*Barging was portrayed by RTE as not being critical to the development, decision-makers came to believe that the resource was so good and there were many potential transportation solutions "barging, rail and three ports" – Nov IC Presentation. We misread the government*

[417] Email from Mr Webb to Ms Newell, dated 4 May 2012, subject "*Bid Case reconciliation*" [RT_00341864 to RT_00341868]
[418] Paper titled "*Project Mercury - Infrastructure*", undated, page 11 [RT_00003494 to RT_00003518]
[419] Paper titled "*Project Mercury - Executive Summary*", dated 12 April 2013, page 13 [RT_00001065 to RT_00001091]
[420] Paper titled "*Project Mercury - Commercial*", undated, page 10 [RT_00003749 to RT_00003778]

and the IC papers failed to highlight that Zambeze and Tete East would be uneconomic based on rail"[421];

11.2.15 Identifying the impact of the changes in the Coal Chain matrix is not straightforward because, for example, changes in the Coal Chain matrix might impact production volumes (Ramp-up and annual production capacity) as well as costs (both Operating Costs and Capital Costs). Further, where it has been assumed that a particular Coal Chain solution will transport more than its available capacity, quantifying the impact of using an alternative Coal Chain solution would require a judgement to be made as to what alternative solution would have been used.

11.2.16 Therefore, in order to quantify this apparent change in the Coal Chain solution, I have based my calculation on Rio Tinto's own assessment of the impact of assuming rail in the Acquisition Model rather than Barging[422]. On this basis, the NPV computed by the Acquisition Model would reduce from US$3,140 million to US$1,637 million.

11.2.17 Moreover, Rio Tinto had identified that a Greenfield Railway solution would be required as part of the Coal Chain by the end of Period 1. Therefore, the Q4 2011 AOP Model and Q1 2012 AOP Model were not reasonable because they required capacity from the Greenfield Railway but did not include the Capital Costs of the Greenfield Railway.

[421] Paper titled "*Project Mercury - Commercial*", undated, page 1 [RT_00003749 to RT_00003778]

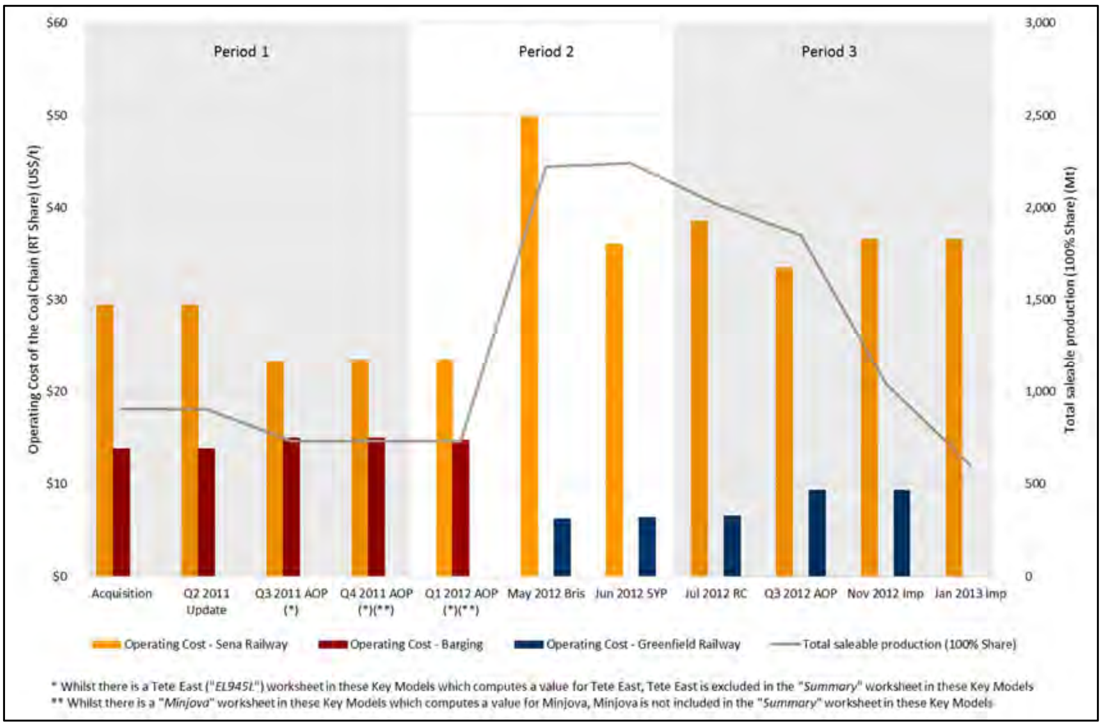
[422] The Project Mercury review team explained that "*Anglo in its January 2011 due diligence apparently valued Riversdale based on rail, because it considered that barging was not possible either technically or politically. PJP's AVT report indicated that rail to Nacala based on its estimates, could cost between $30 (Zambeze and Tete East marginal) and $50 per tonne (both uneconomic) more than barging. Rail versus barging alone reduced the valuation by ~A$9 per share. The share price at A$9 to A$10, probably reflected Benga Stage 1, cash, ZAC and option value associated with Benga, Zambeze, Wisco (contingent) and Tete East or bid speculation*" (Paper titled "*Project Mercury - Commercial*", undated, page 11 [RT_00003749 to RT_00003778])

11.3 The Operating Cost of the Coal Chain

The Operating Cost of the Coal Chain assumed in the Key Models

11.3.1 In the graph below I summarise the Operating Cost of the Coal Chain assumed in each of the Key Models. I also set out the total saleable production (100% Share) by Coal Chain solution:

Figure 11B: The Operating Cost of the Coal Chain[423]



11.3.2 It is evident from Figure 11B that:

(a) the Coal Chain option that had the lowest Operating Cost was the Greenfield Railway. Between the May 2012 Brisbane Model and the Q3 2012 AOP Model, the Operating Cost of Greenfield Railway increased from US$6.2/t to US$9.3/t, an increase of 50%. However, when the Capital Cost is also included, the Greenfield Railway is not the lowest cost Coal Chain solution;

(b) in the five models in which Barging was included, the Operating Cost remained broadly consistent at circa US$14/t; and

[423] The Drewe Model/the Key Models

(c) the Operating Cost of the Sena Railway fluctuated significantly during the Post Transaction Period: from an initial US$29.5/t in the Acquisition Model, decreasing to around US$23.5/t in the Q3 2011 AOP Model to the Q1 2012 AOP Model, then rising significantly to around US$50/t in the May 2012 Brisbane Model and finally fluctuating between around US$33.5/t and US$38.5/t in the other Key Models.

My assessment of the reasonableness of the Operating Cost of the Coal Chain assumed in the Key Models

<u>The Operating Cost of Barging</u>

11.3.3 As identified in paragraph 11.3.2(b) above, the Operating Cost of Barging remained broadly consistent at approximately US$14/t. For the purposes of my report, I have assumed that at the end of Period 1 or beginning of Period 2, Rio Tinto identified that the estimated Operating Cost of Barging was significantly more than this amount. My assumption is consistent with the available evidence[424]. In relation to the cost of Barging the Project Mercury review team identified that:

"*The RTM report was ambiguous. Although the assumptions were apparently discussed by RTE and RTM, the assumptions in the model only included a 15% contingency and not 50% as RTM intended. The impact of this was ~A$1 per share. In addition barging was assumed to be financed and run by a third-party with lease rates calculated using a WACC of 7% and therefore excluded the 1% country risk element – the impact of this was a further ~A$0.5 per share*"[425].

[424] For example, (i) a document titled "*Key Messages & Communications Strategy – Infrastructure*" dated 5 January 2012, referred to an estimated Operating Cost of Barging of US$25/t (RTCM Key Messages & Communications Strategy - Infrastructure, January/February, 2012, page 3 [RT_00321848 to RT_00321855]); (ii) a document titled "*RTCM Key Messages & Communications Strategy – Infrastructure*", dated 5 March 2012, referred to estimated Operating Cost of Barging of US$25/t to US$30/t (RTCM Key Messages & Communications Strategy - Infrastructure, March/April, 2012, page 2 [RT_00041393 to RT_00041401]); (iii) Ms Newell explained the estimated cost of approximately US$30/t was provided by the barging team in the first half of 2012 (Ms Newell deposition transcript, dated 27 September 2018, pages 161 and 162); and (iv) a Rio Tinto presentation titled "*Information Pack – Credit Agricole*", dated 29 March 2012, referred to estimated Operating Cost of Barging of US$33/t (it would appear that this cost is based on another company, "*InfraCo*", building the Barging solution and charging Rio Tinto a fee per tonne) (Rio Tinto Coal Mozambique, Information Pack – Credit Agricole, dated 29 March 2012, page 7 [RT_SEC_00248879 to RT_SEC_00248889])
[425] Paper titled "*Project Mercury - Commercial*", undated, page 11 [RT_00003749 to RT_00003778]

The Operating Cost of the Sena Railway

11.3.4 As set out at paragraph 11.3.2(c) above, the Operating Cost of the Sena Railway fluctuated significantly during the Post Transaction Period. During Period 1, the Operating Cost of the Sena Railway decreased from US$29.5/t to US$23.5/t. This decrease is largely due to a fee-based port charge of US$4.7/t not being included in the Q3 2011 AOP Model, Q4 2011 AOP Model and Q1 2012 AOP Model in relation to Zambeze[426].

11.3.5 I have not seen any documents explaining why this fee was excluded from these models. In the May 2012 Brisbane Model, this fee-based port charge was included (initially at a rate of US$5.2/t and then at a rate of US$10.2/t from 2017)[427]. In the absence of any document explaining why this fee was excluded in the Q3 2011 AOP Model, Q4 2011 AOP Model and Q1 2012 AOP Model, it is logical to conclude (and I have assumed) that it was an error.

11.3.6 In Period 2, the Operating Cost of the Sena Railway increased significantly, to US$50/t in the May 2012 Brisbane Model, before reducing to a cost of between US$33.5/t to US$38.5/t[428]. These estimates are also referred to in the contemporaneous documents[429].

The Operating Cost of the Greenfield Railway

11.3.7 As set out at paragraph 11.3.2(a), the Operating Cost of the Greenfield Railway assumed in the Key Models ranged between US$6.2/t and US$9.3/t.

11.3.8 A presentation titled "*Information Pack – Credit Agricole*", dated 29 March 2012, refers to an estimate of the Operating Cost of the Greenfield Railway between US$33/t (for a 50Mtpa Greenfield Railway solution) and US$26/t (for a 75Mtpa Greenfield Railway solution)[430]. However, this cost appears to be based on another company, "*InfraCo*", building the Greenfield Railway and charging Rio Tinto a fee per tonne.

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426 The Drewe Model/the Key Models
427 The Drewe Model/the Key Models
428 The Drewe Model/the Key Models
429 Rio Tinto Coal Mozambique, Studies – work in progress, dated July 2012, page 22 [RT_00231593 to RT_00231619]**;** Email from Mr Webb to Ms Newell, dated 4 May 2012, subject "*Bid Case reconciliation*" [RT_00341864 to RT_00341868]; Email from Mr Webb to Mr Morris (cc: Ms Newell and Mr Maglione), dated 10 August 2012, subject "*RE: RTCM Conceptual Growth Programme – IC noting paper v2 (2) AW.docx*" [RT_00342123 to RT_00342126]
430 Rio Tinto Coal Mozambique, Information Pack – Credit Agricole, dated 29 March 2012, page 7 [RT_SEC_00248879 to RT_SEC_00248889]

11.3.9 I have also identified:

(a) a document titled "*Post-Integration Cost Review – Draft*" dated 1 March 2012 which referred to an estimated Operating Cost of US$5.80/t[431]; and

(b) a document titled "*Studies – work in progress*" dated July 2012 which referred to an estimated Operating Cost of US$6.35/t[432].

11.3.10 Based on these documents, the Operating Cost of the Greenfield Railway assumed in the Key Models, assuming that Rio Tinto would incur the Capital Cost of building the Greenfield Railway, appears reasonable.

[431] Rio Tinto Coal Mozambique, Post-Integration Cost Review - Draft, dated 1 March 2012, page 28 [RT_00337001 to RT_00337045]

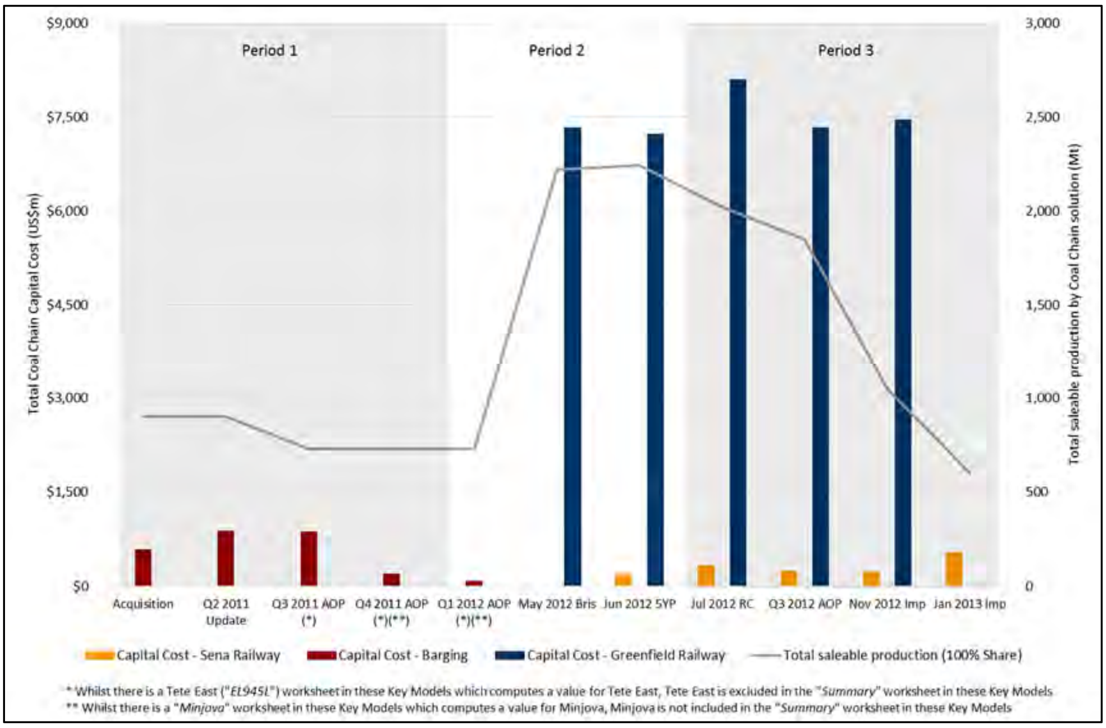
[432] Rio Tinto Coal Mozambique, Studies – work in progress, dated July 2012, page 22 [RT_00231593 to RT_00231619]

11.4 The Capital Cost of the Coal Chain

The Capital Cost of the Coal Chain assumed in the Key Models

11.4.1 In the graph below, I summarise the Capital Cost of the Coal Chain assumed in each of the Key Models. I also set out the total saleable production by Coal Chain solution (100% Share).

Figure 11C: The Capital Cost of the Coal Chain (RT Share)[433]



11.4.2 As can be seen from Figure 11C above, the Capital Cost of the Greenfield Railway was significantly greater than the Capital Cost of Barging and Sena Railway. Further, despite all of the Key Models in the Post Transaction Period including the Sena Railway as part of the Coal Chain matrix, there was no Capital Cost of this option until the June 2012 5YP Model (US$187 million).

My assessment of the reasonableness of the Capital Cost of the Coal Chain assumed in the Key Models

11.4.3 As described above, the Acquisition Model does not appear to include any Capital Cost of the Sena Railway. I have assumed for the purposes of my report that, by September 2011, Rio

[433] The Drewe Model/the Key Models

Tinto had identified that a Capital Cost would be required. My assumption is consistent with the available evidence[434]. On this basis, it is not clear why there was no Capital Cost included in the Key Models until the June 2012 5YP Model.

11.4.4 Further, as can be seen in Figure 11C, the cost of the Greenfield Railway is substantial, ranging from US$7.2 billion to US$8.1 billion across the relevant Key Models.

11.4.5 As explained at paragraph 11.2.8, for the purposes of my report I have assumed that Rio Tinto was aware that a Greenfield Railway solution was required from as early as October 2011. However, none of the Key Models prior to the May 2012 Brisbane Model included any capital expenditure for a Greenfield Railway solution. I note that an estimate of the required capital expenditure was set out in an internal Rio Tinto memorandum dated 13 November 2011:

"*The capital cost estimate for this green field coal chain is $4.5 - $5.5B [confirm from GB] for 25mntpa, growing to $8.2B for 100mntpa*"[435].

11.4.6 A more detailed estimate of the capital expenditure in relation to the Greenfield Railway was set out in a Draft Post-Integration Cost Review in March 2012:

"***Capex Stage 1 (25mtpa) capex is $6.76bn; Stage 2 (50mtpa) incremental is $887m; Stage 3 (75mtpa) is $1.02bn, and Stage 4 (100mtpa) would be $833m***" [emphasis added][436].

11.4.7 These cumulative estimates in March 2012 are summarised in the table below:

[434] An extract from the September 2011 RTCM Coal Chain Position Paper explains: "*Key developments that have occurred since due diligence include*: […] *CFM and CCFB lack of capability to complete upgrade of Sena Line, requiring reduction in capacity estimates and requirement for RTCM to fund some upgrade programs to ensure safe and viable operations* [...] *CFM's lack of funds to upgrade port capability to 24 hour operations, requiring RTCM to fund buoyage upgrades (and tugs) to achieve*" (RTCM Coal Chain Position Paper - September 2011, page 1 [RT_00022911 to RT_00022926]); and (ii) an email from Mr Webb to Ms Newell, dated 4 May 2012, explained that for RTCM to have an 8Mtpa capacity on the Sena Railway, capital expenditure of approximately US$750 million was required (Email from Mr Webb to Ms Newell, dated 4 May 2012, subject "*Bid Case reconciliation*" [RT_00341864 to RT_00341868])

[435] Future Corridors - President's Visit Follow Up, page 6 [RT_00024876 to RT_00024882]

[436] Rio Tinto Coal Mozambique, Post-Integration Cost Review – Draft, dated 1 March 2012 [RT_00337001 to RT_00337045]

Table 11A: Rio Tinto's estimate of the Capital Cost of the Greenfield Railway

Capex stage	Incremental cost *US$'b*	Cumulative cost *US$'b*
Stage 1 (25Mtpa)	6.76	6.76
Stage 2 (50Mtpa)	0.89	7.65
Stage 3 (75Mtpa)	1.02	8.67
Stage 4 (100Mtpa)	0.83	9.50

11.4.8 Once capital expenditure was included in the Key Models (from the May 2012 Brisbane Model), it was broadly consistent with the estimates set out in Table 11A above.

11.4.9 I note that in an email dated 16 April 2012, Ms Newell states that an estimated Capital Cost for a Greenfield Railway in the region of US$10 billion to US$12 billion was appropriate (rather than US$18 billion, which had also been suggested at that time)[437]. Capital Costs for the Greenfield Railway of this magnitude are not reflected in any of the Key Models.

11.4.10 The March 2012 Draft-Post-Integration Cost Review explains that:

"*Total breakeven cost per tonne ramps up massively if volumes do not get to at least 50mtpa on the corridor*"[438].

11.4.11 This therefore further identifies the importance of the volumes of production from Tete East and Minjova to Rio Tinto's ability to include the low-cost high-volume Greenfield Railway in its DCF models.

11.5 The sale of spare capacity

11.5.1 In certain of the Key Models, Rio Tinto assumed that it would have capacity in the Greenfield Railway that it had developed and that it could sell this spare capacity. This sale of spare capacity therefore represented a further revenue stream to Rio Tinto, thereby increasing the computed NPV. In the May 2012 Brisbane Model, it was assumed that the sale of spare capacity would provide US$23 billion of revenue over the life of the project. This is a critical assumption because, without the revenue from this sale of spare capacity, Rio Tinto would

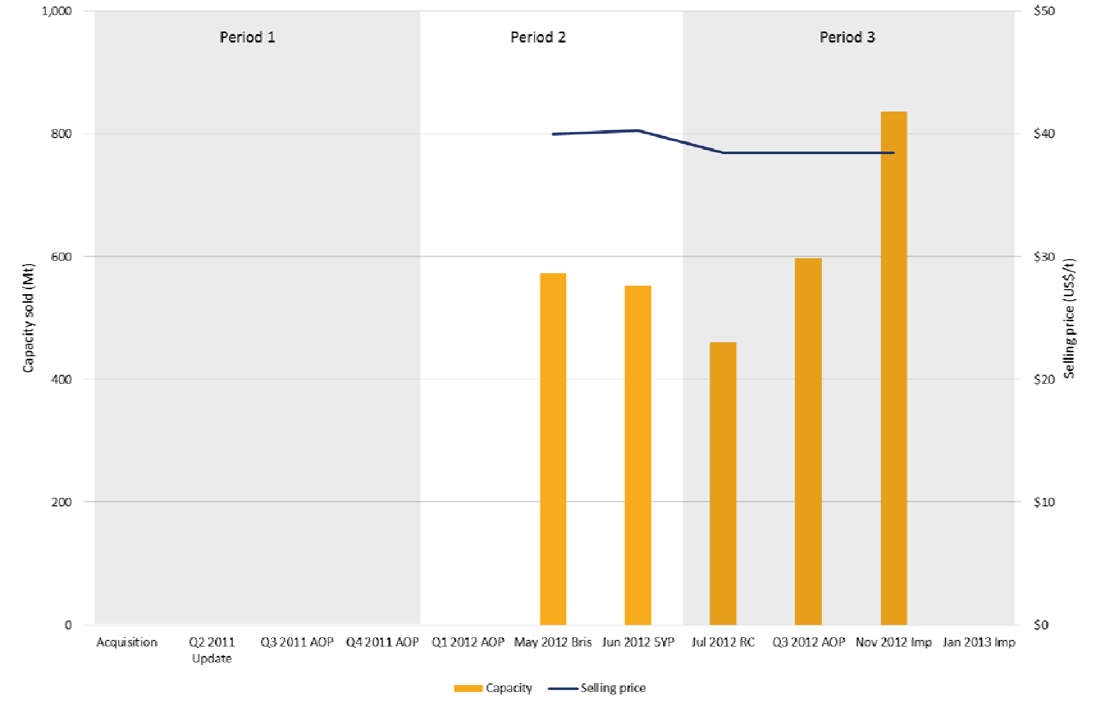
[437] Email from Ms Newell to Mr Ritchie, dated 16 April 2012, subject "*IC doc and PDI story*" [RT_SEC_00260703 to RT_SEC_00260711]
[438] Rio Tinto Coal Mozambique, Post-Integration Cost Review – Draft, dated 1 March 2012, slide 28 [RT_00337001 to RT_00337045]

not be able to justify the construction of the Greenfield Railway, meaning that it would require an alternative, higher cost and lower volume, Coal Chain solution.

The sale of capacity assumed in the Key Models

11.5.2 In the graph below, I summarise the volume of spare capacity that Rio assumed would be able to be sold in each of the Key Models, together with the assumed selling price.

Figure 11D: The sale of spare capacity[439]



11.5.3 Therefore, Rio Tinto assumed that it could sell spare capacity in the May 2012 Brisbane Model to the November 2012 Impairment Model. The assumed selling price in these models remained broadly consistent.

My assessment of the reasonableness of the sale of spare capacity assumed in the Key Models

11.5.4 In order to include the sale of spare capacity in the DCF Models, I would expect there to be consideration by Rio Tinto of (i) the parties to whom the spare capacity could be sold, (ii) an

[439] The Drewe Model/the Key Models

assessment of the volumes that could be sold to these parties, and (iii) the price at which this spare capacity could be sold.

11.5.5 In my review of 15,000 documents, I have not identified any documents that provide this analysis[440].

11.5.6 As a result, in my opinion the inclusion of the sale of spare capacity in the May 2012 Brisbane Model to the November 2012 Impairment Model was not reasonable. If the income from the sale of the spare capacity is not included in these Key Models, the decrease in the computed NPVs is between US$1,194 million and US$2,525 million. In particular, the impact on the NPV of the May 2012 Brisbane Model is as follows:

Table 11B: Sensitivity analysis – removing the spare capacity sales from the May 2012 Brisbane Model[441]

	May 2012 Bris	Revised NPV	Impact of Sensitivity
	US$'m	*US$'m*	*US$'m*
Benga	561	561	-
Zambeze	379	379	-
Tete East	354	354	-
ZAC	-	-	-
Minjova	816	816	-
Infrastructure enablers	(3,115)	(4735)	(1,620)
Other	18	337	319
Total (excluding net debt / cash)	**(987)**	**2,287**	**(1,301)**

11.6 Conclusion on the reasonableness of the Coal Chain assumptions

11.6.1 Considering the Coal Chain assumptions in the light of (i) Rio Tinto's contemporaneous valuation guidelines; (ii) the requirements of a FVLCS assessment undertaken in accordance with IFRS and Rio Tinto's Controller's Manual; and (iii) the available contemporaneous

[440] I note that Mr Maglione states that he performed some analysis of the potential growth of other coal producers and analysis was also performed in the second half of 2012 (Mr Maglione deposition transcript, dated 11 October 2019, pages 109 to 111). However, I have not been able to identify this analysis

[441] Mazars' analysis

evidence of the facts and circumstances that existed in the Post Transaction Period, my conclusions are as follows:

(a) the Coal Chain matrix assumptions:

(i) the inclusion of Barging in certain of the Key Models was, at face value, not reasonable because Rio Tinto appears to have been aware (as early as November 2011) that there were significant issues with the Barging solution:

(ii) the Sena Railway assumptions in certain of the Key Models, which assumed saleable production of up to 17.1Mtpa being transported by the Sena Railway, were not reasonable because Rio Tinto appears to have been aware that its share of the Sena Railway would likely be constrained to around 6Mtpa; and

(iii) the Greenfield Railway assumptions in certain of the Key Models were not reasonable because the costs of the Greenfield Railway were not included;

(b) the Coal Chain Operating Cost assumptions:

(i) the Operating Costs of Barging in certain of the Key Models, of approximately US$14/t, do not appear reasonable because Rio Tinto appears to have been aware that, even if Barging was considered feasible, the Operating Cost would be around US$25/t to US$33/t;

(ii) the Operating Costs of the Sena Railway in certain of the Key Models do not appear reasonable because they appear to exclude a fee-based port charge related to the Sena Railway for the Zambeze tenement; and

(iii) the Operating Costs of the Greenfield Railway (when actually included in the Key Model) appear reasonable;

(c) the Coal Chain Capital Cost assumptions:

(i) the Capital Costs in certain of the Key Models do not appear reasonable because they did not include any Capital Cost for the Sena Railway, despite Rio Tinto appearing to have identified that a Capital Cost would be required; and

(ii) the Capital Costs of the Greenfield Railway (when actually included in the Key Models) appear reasonable; and

(d) the assumption that Rio Tinto could sell any spare capacity in certain of the Key Models was not reasonable because I have not identified any documents or analysis that show that Rio Tinto had; (i) identified potential purchasers of the spare capacity; (ii) the potential capacity required by any potential purchasers; nor (iii) the price that any potential purchasers would be willing to pay. The assumed ability to sell any spare capacity of the Greenfield Railway is a critical assumption because, without the revenue from this sale of spare capacity, Rio Tinto would not be able to cover the significant cost of construction of the Greenfield Railway, meaning that it would require an alternative, higher cost and lower volume, Coal Chain solution.

12 Other cost assumptions

12.1 Introduction

12.1.1 In Section 11 I considered the Coal Chain cost assumptions. In this Section, I address other (that is non-Coal Chain) cost assumptions, which comprise other Capital Costs (**Section 12.2**) and other Operating Costs (**Section 12.3**).

12.1.2 In particular I identify the other cost assumptions that impacted the computed NPV of the Key Models and I consider whether these other cost assumptions were reasonable in the light of:

(a) Rio Tinto's contemporaneous valuation guidelines, including PEG (such as the requirement for a CECF);

(b) the requirements of a FVLCS assessment undertaken in accordance with IFRS and Rio Tinto's Controller's Manual; and

(c) the available contemporaneous evidence of the facts and circumstances that existed in the Post Transaction Period.

12.1.3 I conclude that I have not identified anything which suggests that the other cost assumptions in the Key Models are unreasonable.

12.2 Other Capital Costs

12.2.1 Other Capital Costs include: (a) mining and HME[442] Capital Costs; (b) infrastructure Capital Costs; (c) Sustaining Capital Costs; and (d) Closing Capital Costs. In this Section:

(a) first, I identify the other Capital Costs assumed in the Key Models (paragraphs 12.3.2 to 12.3.3); and

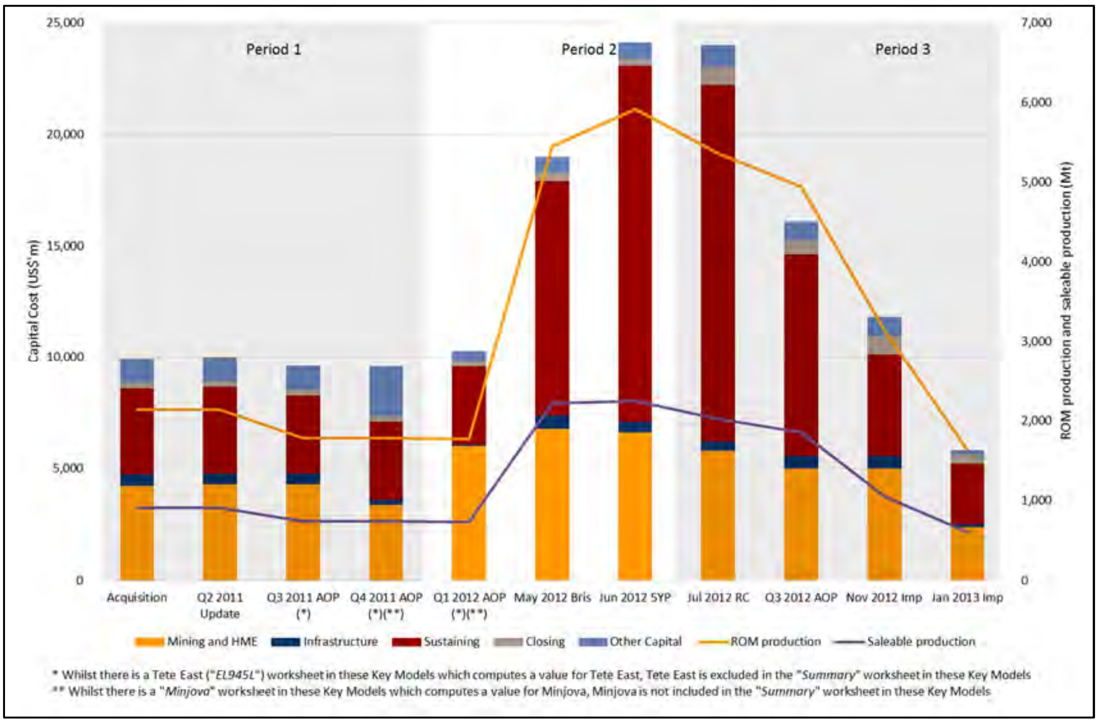
(b) I then consider the reasonableness of the other Capital Costs assumed in the Key Models (paragraph 12.3.4).

[442] HME meaning Heavy Mining Equipment

The other Capital Costs assumed in the Key Models

12.2.2 In the graph below, I summarise the other Capital Costs assumed in the Key Models. This graph includes the total amount of other Capital Costs and, for context, the LOM saleable and ROM production.

Figure 12A: The other Capital Costs assumed in the Key Models



12.2.3 It is evident from Figure 12A that other Capital Costs fluctuated during the Post Transaction Period as follows:

(a) in Period 1, other Capital Costs remained broadly consistent;

(b) in Period 2, other Capital Costs in the May 2012 Brisbane Model increased significantly. This appears to have been a function of an increase in mining and HME Capital Costs and Sustaining Capital Costs. These increases are expected given the increase in production in this model (as a result of the inclusion of Tete East and Minjova). Other Capital Costs in the June 2012 5YP Model continued to increase, reflecting a further increase in ROM production; and

(c) in Period 3, other Capital Costs reduced significantly to the January 2013 Impairment Model. Again, this decrease is expected given the decrease in production in this model

(in particular as a result of the Tete East and Minjova not being included) in the computed NPV.

My assessment of the reasonableness to the other Capital Costs assumed in the Key Models

12.2.4 I have not identified any information which suggests that other Capital Costs assumed in the Key Models were not reasonable.

12.3 Other Operating Costs

12.3.1 Other Operating Costs principally include[443] mining and processing costs, such as removal of overburden[444] and other operating costs, which include management and corporate charges:

(a) first, I identify the other Operating Costs assumed in the Key Models (paragraphs 12.3.2 to 12.3.3); and

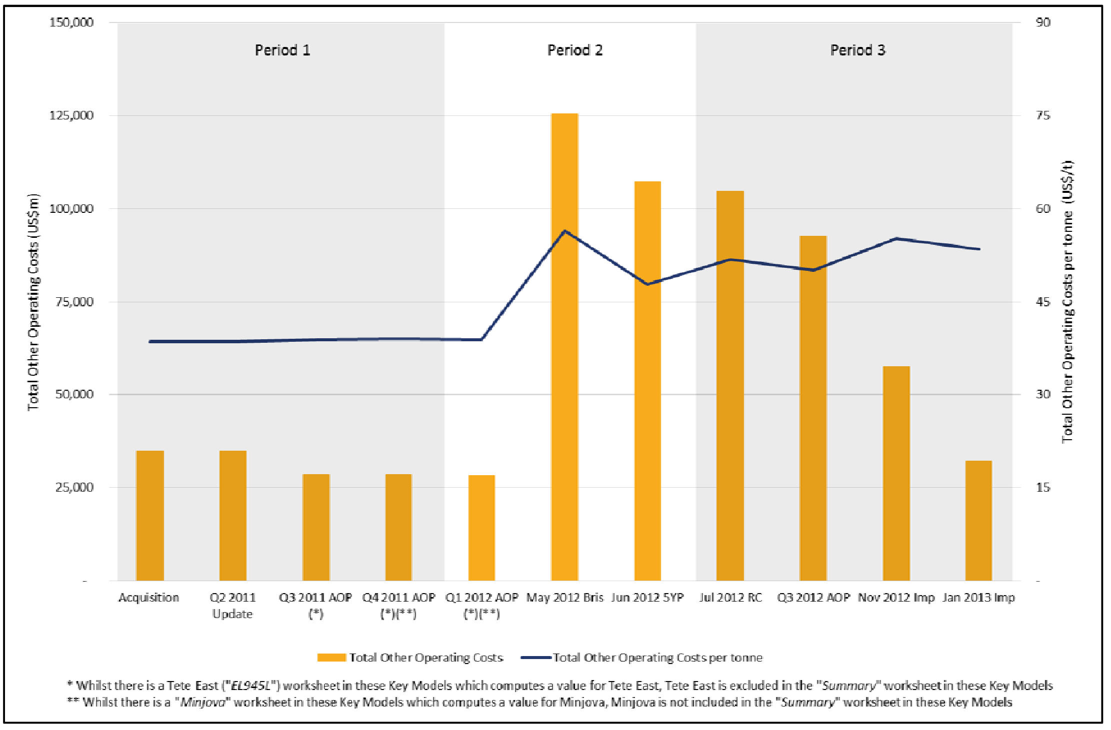
(b) I then consider the reasonableness of the other Operating Costs assumed in the Key Models (paragraphs 12.3.4 to 12.3.5).

The other Operating Costs assumed in the Key Models

12.3.2 In the graph below, I summarise the other Operating Costs assumed in the Key Models. This graph includes the total amount of other Operating Costs and the other Operating Costs per tonne of saleable production. Analysing Operating Costs by reference to the cost per tonne is useful analysis because many of the costs in the Key Models would be anticipated to fluctuate with changes in production[445].

[443] The Drewe Model/the Key Models
[444] Overburden is the waste that has to be removed to access the coal seam
[445] Certain of the other Operating Costs could reasonably instead be analysed by reference to ROM production (or other measures). This would not impact my conclusions

Figure 12B: Other Operating Costs assumed in the Key Models (100% Share)[446]



12.3.3 It is evident from Figure 12B that other Operating Costs increased during the Post Transaction Period. In particular:

(a) when compared with the Acquisition Model, in Period 1, total other Operating Costs remained broadly consistent in the Key Models;

(b) in Period 2, total other Operating Costs increased significantly in the May 2012 Brisbane Model. This increase was as a result of (i) an increase in the volume of saleable production (for example from the inclusion of Tete East and Minjova), and (ii) an increase in the cost of mining per tonne (such as the cost of overburden); and

(c) in Period 3, other Operating Costs per tonne continued to increase. In the January 2013 Impairment Model, other Operating Costs were US$53.47/t compared with the US$38.51/t assumed in the Acquisition Model.

[446] The Drewe Model/the Key Models

My assessment of the reasonableness of the other Operating Costs assumed in the Key Models

12.3.4 The increase in the other Operating Costs is referred to in the final slides of both the Draft May 2012 Brisbane Presentation[447] and the Final May 2012 Brisbane Presentation[448]. The draft presentation explained that "*Operating costs are higher than envisaged*". The draft and final presentations both identify:

(a) an increase in total overburden (and strip ratio[449]) at Benga, from 3.9Bt to 5.2Bt; and

(b) an increase in total overburden (and strip ratio) at Zambeze, from 10.1Bt to 14.2Bt.

12.3.5 Whilst these increases appear to have been included in the May 2012 Brisbane Model (as evidenced by the increasing other Operating Cost per tonne in that model), they were not included in the Q4 2011 AOP Model and the Q1 2012 AOP Model. It is not clear from the available information whether these should have been factored into Key Models earlier than the May 2012 Brisbane Model.

12.4 Conclusion on the reasonableness of the other cost assumptions

12.4.1 Considering the other cost assumptions in the light of (i) Rio Tinto's contemporaneous valuation guidelines; (ii) the requirements of a FVLCS assessment undertaken in accordance with IFRS and Rio Tinto's Controller's Manual; and (iii) the available contemporaneous evidence of the facts and circumstances that existed in the Post Transaction Period, I have not seen anything which suggests that the assumptions in the Key Models were unreasonable.

[447] Draft May 2012 Brisbane Presentation [RT_00351366 to RT_00351417]
[448] Final May 2012 Brisbane Presentation [RT_00278107 to RT_00278133]
[449] The strip ratio is the ratio between waste material and ROM production

13 My conclusion: the result of an impairment test as of 30 June 2012

13.1 Introduction

13.1.1 In the context of my analysis in Sections 3 to 12 above, in this Section I assess whether, had Rio Tinto undertaken an impairment test in relation to the RTCM Assets as at 30 June 2012, it would have led to a material impairment in Rio Tinto's 2012 Interim Financial Statements.

13.1.2 Specifically:

(a) I first identify the carrying value of the RTCM CGU at 30 June 2012 (**Section 13.2**) to be in the region of US$3,487 million (excluding cash). Adopting a materiality of US$250 million means that a material impairment would have been required if the FVLCS of the RTCM CGU was assessed as US$3,237 million or lower;

(b) I then identify the relevant Plan NPV to be used as a starting point for the assessment of the FVLCS of the RTCM CGU at 30 June 2012 (**Section 13.3**). Having considered the Key Models, I conclude that the May 2012 Brisbane Model is an appropriate starting point in this regard, which had a computed NPV of -US$987 million; and

(c) I then consider (**Section 13.4**) the adjustments to the May 2012 Brisbane Model required by:

(i) Rio Tinto's contemporaneous valuation guidelines, including PEG;

(ii) the requirements of a FVLCS assessment undertaken in accordance with IFRS and Rio Tinto's Controller's Manual; and

(iii) the available contemporaneous evidence of the facts and circumstances that I have assumed existed in the Post Transaction Period; and

(d) finally, I provide my conclusion (**Section 13.5**). In particular, I conclude that, if Rio Tinto had undertaken an impairment test in relation to the RTCM Assets, the assessed FVLCS of the RTCM CGU would have been significantly less than US$3,237 million. Therefore, had Rio Tinto undertaken an impairment test in relation to the RTCM Assets

as at 30 June 2012, in my view it would have led to a material impairment in Rio Tinto's 2012 Interim Financial Statements.

13.2 The carrying value of the RTCM CGU at 30 June 2012

13.2.1 Mr Brice has identified that the carrying value of the RTCM CGU as at 30 June 2012 was US$3,550 million, as summarised in the table below[450].

Table 13A: The carry value of the RTCM CGU as at 30 June 2012[451]

	Carrying amount at 30 June 2012 ***US$'m***
Benga	2,071
Zambeze and Tete East	1,832
Other assets and liabilities (including cash)	134
	4,037
Goodwill	541
Deferred tax liability	(1,028)
Total carrying amount	**3,550**

13.2.2 Mr Brice has also confirmed that, in the context of an impairment test of the RTCM CGU, the impairment test should be undertaken net of cash – this view is also explained by Rio Tinto contemporaneously[452], and was the approach taken in the January 2013 Impairment. The balance of cash held by RTCM at 30 June 2012 was US$63 million[453]. Therefore, the carrying value of the RTCM CGU excluding cash at 30 June 2012 was US$3,487 million[454].

13.2.3 Mr Brice also explains the concept of materiality[455]. Mr Brice explains that Rio Tinto's auditors assessed materiality in Rio Tinto's 2012 Interim Financial Statements to be US$250 million and Mr Brice concludes that this assessment was reasonable[456].

[450] Brice 1, Table 4E
[451] Brice 1, Table 4E
[452] January 2013 Impairment Paper, page 6 [RT_00257820 to RT_00257836]
[453] Brice 1, Table 4E
[454] US$3,550 million – US$63 million
[455] Brice 1, Section 11.6
[456] Brice 1, Section 11.6

13.2.4 On this basis, a material impairment would have been required if the computed FVLCS of the RTCM CGU at 30 June 2012 was assessed to be US$3,237 million[457] or less.

13.3 The relevant Plan NPV to be used as a starting point for assessing the FVLCS of the RTCM CGU as at 30 June 2012

13.3.1 As explained in Section 5 above, if Rio Tinto had undertaken an impairment test in relation to RTCM at 30 June 2012, it would have been required to base its assessment of the FVLCS of the RTCM CGU on a Plan NPV produced in accordance with PEG.

13.3.2 When considering the Plan NPV to be used as a starting point for assessing the FVLCS of the RTCM CGU as at 30 June 2012, there are a number of DCF models that could have been used as a starting point. In particular, these models include:

(a) the May 2012 Brisbane Model, which had a computed NPV of -US$987 million;

(b) the June 2012 5YP Model, which had a computed NPV of US$1,113 million. As I explain in Section 6.4, the June 2012 5YP Model represents the "*Possible*" case in the RTCM June 2012 5YP, which is not the "*central case*", and is described by Mr Morris as the "*aspirational view*"[458]; and

(c) the July 2012 Reference Case Model, which had a computed NPV of US$2,352 million. However, as I identify in Section 9.2, this Key Model does not include the long-term commodity prices set out in the latest PEG Update. If the prices in the July 2012 Reference Case Model are revised to reflect the latest PEG Update, it reduces the computed NPV by US$3,758 million[459] to be -US$1,405 million.

13.3.3 On the basis that the outputs from the May 2012 Brisbane Model were included in presentations provided to Mr Albanese and Mr Elliott, and that the slides for the Brisbane Meeting had been developed over a number of months, it is reasonable to conclude that there is some robustness to the May 2012 Brisbane Model NPV. I have therefore used the May 2012 Brisbane Model as the starting point for an assessment of the FVLCS at 30 June 2012.

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457 US$3,487 million – US$250 million
458 Mr Morris deposition transcript, dated 8 November 2018, pages 127 and 128
459 See paragraph 9.2.18

13.3.4 For ease of reference, in the table below, I set out the computed NPV in the May 2012 Brisbane Model.

Table 13B: The May 2012 Brisbane Model (RT Share) – the starting point for my assessment of the FVLCS of the RTCM CGU

	May 2012 Brisbane Model
	US$'m
Benga	561
Zambeze	379
Tete East	354
Minjova	816
Other	(3,097)
Total	**(987)**

13.4 The adjustments required to the May 2012 Brisbane Model to assess FVLCS

13.4.1 Having identified the May 2012 Brisbane Model as a reasonable starting point for assessing the FVLCS of the RTCM CGU, it is then necessary to consider the adjustments to the May 2012 Brisbane Model required by:

(a) Rio Tinto's contemporaneous valuation guidelines, including PEG;

(b) the requirements of a FVLCS assessment undertaken in accordance with IFRS and Rio Tinto's Controller's Manual; and

(c) the available contemporaneous evidence of the facts and circumstances that existed in the Post Transaction Period.

13.4.2 On the basis of my analysis in Sections 8 to 12 above, these adjustments comprise:

(a) certain adjustments which I am able to make to the May 2012 Brisbane Model on the basis of the available information. I address these and quantify their impact on the May 2012 Brisbane Model in paragraphs 13.4.3 to 13.4.6; and

(b) certain adjustments which I am unable to make to the May 2012 Brisbane Model because I do not have sufficient information as to what Rio Tinto's contemporaneous assumptions or judgements would have been had it performed an impairment test at the

time. I address these adjustments in paragraphs 13.4.7 to 13.4.9. Whilst I am able to provide indicative assessments of the potential impact of these adjustments, I am not able to provide a full FVLCS which takes into account all of these factors – simply put, I would be required to produce an entirely new DCF model (including a revised mine plan and Coal Chain solution) and I do not have the information to do so.

The adjustments that I am able to make to the May 2012 Brisbane Model on the basis of the information available

13.4.3 The adjustments that I am able to make to the May 2012 Brisbane Model comprise:

(a) discount rate: the computed NPV in the May 2012 Brisbane Model was based upon a discount rate of 9%, being Rio Tinto's discount rate[460]. However, as I explain in Section 5.6, the discount rate included in an assessment of the FVLCS should be based upon the discount rate of a market participant, not the discount rate of Rio Tinto. I have applied a discount rate of 7.9% (including a 1% premium for Mozambique), being the discount rate applied in the January 2013 Impairment test[461];

(b) commodity prices: as I explain in Section 9.2, the May 2012 Brisbane Model applied January 2012 PEG. However, the latest PEG Update was May 2012 PEG. Updating the May 2012 Brisbane Model for May 2012 PEG has a minimal affect (US$9 million[462]); and

(c) probabilistic adjustments: in Section 5.6 I explain that PEG, IFRS, the Controller's Manual and Rio Tinto's stated accounting policies required probabilistic adjustments to be made where necessary. In relation to the May 2012 Brisbane Model, I have assumed that the following probabilistic adjustments are required:

(i) Zambeze: in the January 2013 Impairment, the computed value of Zambeze was weighted by 75% to reflect the fact that the "*project is still at the conceptual valuation stage. Significant additional ore body knowledge and further study work is required before a full financial assessment can be established*"[463]. Had

[460] See Section 9.4
[461] My analysis suggests the applicable discount rate at 30 June 2012 may actually have been higher. This would decrease the computed NPV
[462] See paragraph 9.2.13
[463] January 2013 Impairment Paper, page 6 [RT_00257820 to RT_00257836]

an impairment review been undertaken six months earlier, it is logical to conclude that a weighting of 75% (if not less) would also have been required to be applied to the computed NPV of Zambeze;

(ii) Tete East and Minjova: although these tenements have a computed value in the May 2012 Brisbane Model, as I explain at Section 10.2, these tenements should only be included as potential upside given the stage of development they were at and the limited resource knowledge. This is consistent with the requirements of PEG and the facts and circumstances relating to these tenements (according to the available documentary evidence):

- PEG required that, in a Plan NPV, "[t]*he volume of ore should not include all the upside or blue sky that can be envisaged, although this potential can be shown as a sensitivity if appropriate*"[464]. In the May 2012 Brisbane Model there is no indication that this requirement was met. In particular, the Project Mercury team later specifically considered Tete East to be "*blue-sky exploration*"[465];

- even if it was appropriate to include production from Tete East and Minjova in a CEFC (which would have been contrary to the requirements of PEG), when computing a FVLCS, Rio Tinto's 2011 Annual Financial Statements explain that:

  "*…non-reserve material is only included where there is a high degree of confidence in its economic extraction*"[466]. I have not seen anything which suggests that there was a high degree of confidence in relation to Tete East or Minjova. Mr Dupree explains that mine plans were not developed until 2013 for Tete East and Minjova due to there being "[i]*nsufficient data*", and that even when the mine plans were developed in 2013 they were "*very preliminary*"[467]; and

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[464] PEG, Volume 2, page 29, Section 7.2.1 [RT_SEC_00115484 to RT_SEC_00115541]
[465] Paper titled "*Project Mercury – Executive Summary*", dated 12 April 2013, page 2 [RT_00001065 to RT_00001091]
[466] Rio Tinto's 2011 Annual Financial Statements, page 143; Rio Tinto's 2012 Annual Financial Statements, page 152
[467] Mr Dupree deposition transcript, dated 20 February 2019 page 43

- in relation to what are described as "*growth projects*", they should be included "*at the risk adjustments agreed upon by local management and Controllers*"[468]. Therefore, even if an amount for Tete East and Minjova should be included, it should be at a risk adjusted amount. This is what Rio Tinto did in the January 2013 Impairment Paper; Tete East and Minjova were part of the potential resource upside; and

(iii) other potential upside and downside. The potential upsides and downsides that were evident at 30 June 2012 include:

- Upsides: the Benga Power Plant, coal bed methane and coal resource upside potential (all of which were referred to in the December 2010 Riversdale Board Paper). The coal resource upside potential would also take into account the potential of Tete East and Minjova; and

- Downsides: value leakage through GoM transfer (in Section 8.2 above I explain that Rio Tinto were aware of this downside in August 2011) and tax adjustments.

In the January 2013 Impairment, these same potential upsides and downsides were assessed in the FVLCS to be US$126 million (being US$1,216 million x 10% risk weighting). It is reasonable to conclude that if they had been assessed six months earlier, a similar quantum of upsides and downsides would have been computed.

13.4.4 In the table below I adjust the computed NPV in the May 2012 Brisbane Model for the above factors.

[468] Internal memo, titled "*Impairment Methodologies 2012*", dated 31 August 2012, page 3 [RT_00101098 to RT_00101101]

Table 13C: Adjustments that I am able to make to the May 2012 Brisbane Model

	May 2012 Bris	After adjustments	Weighting	Revised value
	US$'m	***US$'m***		***US$'m***
Benga	561	734	100%	734
Zambeze	379	629	75%	472
Tete East	354	-	-	-
Minjova	816	-	-	-
Other	(3,097)	(2,962)	100%	(2,962)
Total in May 2012 Brisbane Model	***(987)***	***(1,599)***		***(1,756)***
Potential upsides and downsides		1,216	10%	126
Revised value				**(1,630)**

13.4.5 Therefore, adopting the May 2012 Brisbane Model as the basis for the FVLCS assessment, and then making certain adjustments required in a FVLCS assessment, the revised value is -US$1,630 million.

13.4.6 However and importantly, this value does not take into account a number of other factors, the impact of which I am unable to assess (because I do not have sufficient information as to what Rio Tinto's contemporaneous assumptions or judgements would have been). I address these factors below.

The adjustments I am unable to make on the basis of the information available

Production at Benga – potential decrease of US$68 million[469]

13.4.7 The computed NPV of Benga in the May 2012 Brisbane Model is based upon a ROM production of 860Mt. By reference to the Apparent Conversion Ratios, the ROM production assumed in the May 2012 Brisbane Model appears unreasonable – this is because the volume of ROM Production included in the May 2012 Brisbane Model is significantly greater than the volume of production computed based upon the Apparent Conversion Ratios.

[469] See paragraph 10.2.9 *et seq*

Production at Zambeze – potential decrease of US$17 million[470]

13.4.8 In the May 2012 Brisbane Model, LOM saleable production remained broadly consistent with the previous Key Models. However, ROM had increased to 1,591Mt (the yield had decreased which is why LOM saleable production remained broadly consistent). By reference to the Apparent Conversion Ratios, the ROM production assumed in the May 2012 Brisbane Model appears unreasonable – this is because the volume of ROM production included in the May 2012 Brisbane Model is significantly greater than the volume of production computed based upon the Apparent Conversion Ratios.

Sale of spare capacity – potential decrease of US$1,301 million[471]

13.4.9 Rio Tinto do not appear to have performed any detailed analysis of (i) the parties to whom the spare capacity of the Greenfield Rail solution could be sold, (ii) the volumes that could be sold to such parties, and (iii) the price at which this spare capacity could be sold. I therefore have assumed that the inclusion of revenue from the sale of spare capacity on a built Greenfield Railway solution at US$40/t to be unreasonable. This also appears to be the view of Mr Carter, who considered that the assumed sale of spare capacity was "*unrealistic*"[472].

13.5 Conclusion on the result of an impairment test undertaken as at 30 June 2012

13.5.1 A material impairment would have been required if the FVLCS of the RTCM CGU was US$3,237 million or less.

13.5.2 I consider it reasonable to assume that Rio Tinto would have adopted the May 2012 Brisbane Model as the starting point for the FVLCS of the RTCM CGU. This DCF model had a computed NPV of -US$987 million.

13.5.3 It is then necessary to consider the adjustments to the May 2012 Brisbane Model required by:

(a) Rio Tinto's contemporaneous valuation guidelines, including PEG;

[470] See paragraph 10.2.20 *et seq*. I have applied a 75% adjustment to the sensitivity calculation to reflect the probabilistic adjustment I have made to Zambeze (see paragraph 13.4.3(c))
[471] See Section 11.5
[472] Mr Carter deposition transcript, dated 25 October 2018 page 107

(b) the requirements of a FVLCS assessment undertaken in accordance with IFRS and Rio Tinto's Controller's Manual; and

(c) the available contemporaneous evidence of the facts and circumstances that existed in the Post Transaction Period.

13.5.4 I have first made certain adjustments which I consider I am able to make on the basis of the available information (discount rate and probabilistic adjustments). Having made these adjustments, the value of the RTCM Assets is computed to be -US$1,630 million[473]. However, this value does not take into account certain other adjustments that would have been required to have been made to the May 2012 Brisbane Model, including in relation to:

(a) the volume of production assumed at Benga which, following the downgrading of the reserves and resources, by reference to Rio Tinto's Apparent Conversion Ratios appears unreasonable;

(b) the volume of production assumed at Zambeze which, following the downgrading of the reserves and resources, by reference to Rio Tinto's Apparent Conversion Ratios appears unreasonable; and

(c) the sale of the Greenfield Railway spare capacity.

13.5.5 All of the above factors would have decreased the computed FVLCS and my analysis therefore suggests that had Rio Tinto produced a model which took into account all of these factors, it would have resulted in a FVLCS of significantly less than US$3,237 million.

13.5.6 Therefore, in my view, had Rio Tinto undertaken an impairment test in relation to the RTCM Assets as at 30 June 2012, it would have led to a material impairment in Rio Tinto's 2012 Interim Financial Statements.

[473] The value of Benga within this figure is US$734 million which is less than the carrying value of Benga of US$2,071 million. Therefore, even before taking into account other factors, an impairment test undertaken in relation to Benga would have resulted in a material impairment (irrespective of the outcome of an impairment test in relation to the RTCM CGU)

13.6 The indication of value at 30 June 2012 provided to Rio Tinto's auditors

13.6.1 In an Internal memo, titled "*RTCM 2012 HY impairment indicator review*", dated 16 July 2012 ("**HY 2012 Impairment Review**"), Rio Tinto explains that:

"*In the interim to a full review at year end, in order to give some indication of the value of RTCM two different analyses have been performed*"[474].

13.6.2 I address these two analyses in turn below:

The "*potential*" value of US$5.1 billion

13.6.3 Rio Tinto explains that:

"*The impact of some of the more certain changes in circumstances have been quantified*"[475].

13.6.4 These "*more certain changes*" are the impact of:

(a) a 1 percentage point increase in the discount rate;

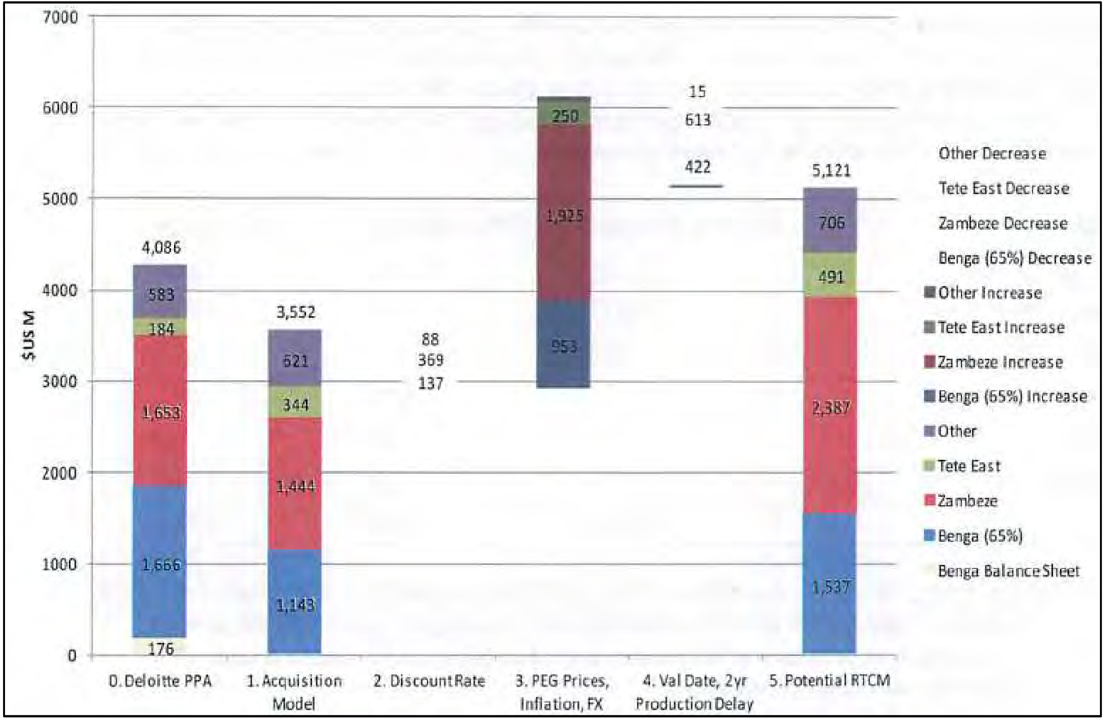
(b) the increase in PEG Prices and changes in inflation and foreign exchange rates; and

(c) change in a valuation date.

13.6.5 Rio Tinto then explains that, adjusting the Acquisition Model NPV for these adjustments, "*result*[s] *in a potential value of $5.1 billion*"[476]. The following waterfall chart was provided by Rio Tinto setting out the results of this analysis:

[474] HY 2012 Impairment Review, page 3 [RT_00225317 to RT_00225323]
[475] HY 2012 Impairment Review, page 3 [RT_00225317 to RT_00225323]
[476] HY 2012 Impairment Review, page 3 [RT_00225317 to RT_00225323]

Figure 13A: The US$5.1 billion "*potential*" valuation produced by Rio Tinto[477]



13.6.6 I note that I have not been able to identify a DCF model prepared in 2012 which produces a valuation of US$5.1 billion. I have been instructed to specifically consider two excel files, being RT_00185576 and RT_00338379, which I understand Rio Tinto suggests contain the US$5.1 billion valuation. However, these Excel files set out Rio Tinto's workings for the waterfall graph included at Figure 13A above; they do not include a DCF analysis of the RTCM CGU and are not in the Acquisition Format or Maglione Format. They therefore do not include the assumptions underpinning the US$5.1 billion valuation.

13.6.7 Importantly, the US$5.1 billion "*potential*" valuation does not include several significant factors, including:

(a) the change in the infrastructure required for the coal chain. The "*potential*" valuation is based upon all production being barged down the Zambezi river despite the fact that:

(i) since November 2011 (if not earlier), Rio Tinto was not expecting all of the output from the mines to be exported via Barging;

[477] HY 2012 Impairment Review, Appendix 2 [RT_00225317 to RT_00225323]

(ii) the GoM appears to have formally rejected Rio Tinto's Barging proposal and Rio Tinto had identified a significant increase in the Operating Cost of Barging; and

(iii) Rio Tinto had apparently "*abandoned*" its plans for Barging;

(b) the significant cost of developing the Greenfield Rail which had been identified by Rio Tinto since circa November 2011;

(c) the downgrading of the mineral resources, including the change in product ratio; and

(d) the impact of the delay in the ramp-up of production.

13.6.8 Moreover, this valuation is fundamentally different to all Rio Tinto's other DCF Models in this period, principally because it does not take into account the impact of the above significant factors. I do not see a basis for how the assumptions in this valuation could be viewed as being "*management's best estimate*"[478] or how it was based upon the "*best information available*"[479] as required by IAS 36, the Controller's Manual and Rio Tinto's disclosed accounting policies.

13.6.9 My conclusion appears consistent with the explanation of Mr Morris who explains that he was "*uncomfortable*"[480] with the US$5.1 billion valuation because it was "*materially different from where the business was at*"[481].

13.6.10 Further, an email chain between Mr Russell-Smith and Mr Morris in August 2012 suggests that updating the US$5.1 billion valuation presented in the HY 2012 Impairment Review for the "*draft coal prices*" at that date would "*result in a revised valuation of c. $2.6bn*"[482].

13.6.11 I also note that Mr Morris explained that the model used for the acquisition would not be expected to be as detailed as the Maglione Format models because Rio Tinto did not have

478 Rio Tinto's 2011 Annual Financial Statements, page 143; Rio Tinto's 2012 Annual Financial Statements, page 152

479 Rio Tinto's 2011 Annual Financial Statements, page 143; Rio Tinto's 2012 Annual Financial Statements, page 152; Controller's Manual (C360 Impairment of Non-Current Assets), paragraph 6.3 [RT_SEC_00011971 to RT_SEC_00011982]

480 Mr Morris deposition transcript, dated 8 November 2018, page 132

481 Mr Morris deposition transcript, dated 8 November 2018, page 132

482 See paragraphs 9.2.16 and 9.2.17

access to the same level of information during the acquisition process[483]. Further, the Project Mercury team concluded that the Acquisition Model "*did not follow PEG and could not be considered central estimates*"[484]. Therefore, in the context of an impairment test, I would not expect Rio Tinto to have simply made adjustments to the Acquisition Model.

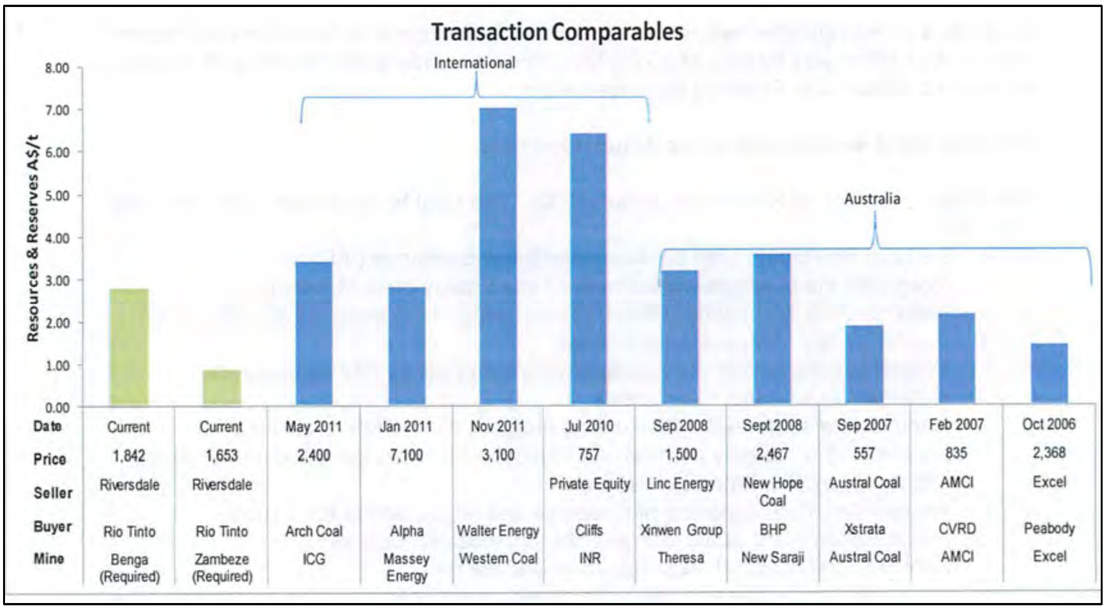
Analysis of comparable transactions

13.6.12 Rio Tinto explains in the HY 2012 Impairment Review that:

"*In order to support our valuation at 30 June 2012 we have also re-benchmarked our position inclusive of the new JORC resource and reserve estimates on a $/t basis against comparable transaction*"[485].

13.6.13 Rio Tinto provided the following chart in this respect:

Figure 13B: The comparable transaction analysis produced by Rio Tinto[486]



13.6.14 Rio Tinto then concluded that this analysis:

[483] Mr Morris deposition transcript, dated 8 November 2018, page 38
[484] Paper titled "*Project Mercury - Executive Summary*", dated 12 April 2013, page 13 [RT_00001065 to RT_00001091]
[485] HY 2012 Impairment Review, page 3 [RT_00225317 to RT_00225323]
[486] HY 2012 Impairment Review, Appendix 2 [RT_00225317 to RT_00225323]

"*indicates that even after the significant reduction in resource/reserves the allocated value is still well within (or even below) the range of comparable transactions*"[487].

13.6.15 However a multiple of reserves and resources analysis does not take into account the significant infrastructure challenges that were being experienced in relation to RTCM. In an audit working paper relating to the January 2013 impairment of RTCM, PwC recorded that:

"*RT also considered Anglo American's ("Anglo") proposed acquisition of Revuboe mine in Mozambique, which was not yet closed at the time of our review, to sense check whether the resulting value of $0.6bn is a fair representation from a fair value perspective. Using the latest JORC report based resource amount of 2.6bn tonnes and the purchase price offered by Anglo, such an approach would suggest a value of $1.7bn. However, **RT further considered the current knowledge of ore bodies and the infrastructure challenges that they are facing and reached a conclusion that it is likely that any potential buyer of RTCM assets would identify these challenges during the due diligence process** and hence offer a price similar to RT's revised FVLCS estimate. Whilst RT's conclusion on the comparable transaction cross check are based on number of subjective judgements and assumptions, we do not consider RT's approach and conclusions to be unreasonable in the light of the current uncertainties surrounding RTCM assets*" [emphasis added][488].

13.6.16 For this reason, it is likely that the transactions referred to by Rio Tinto were not appropriate comparators on the basis that these mining companies did not have the same infrastructure challenges. PwC explained only six months later:

"*We also note that we did not find any directly comparable transactions which could be used in benchmarking to derive the FVLCS of RTCM during our market analysis*"[489].

13.6.17 Importantly, when considering mining companies, each property is unique with respect to geology, mineralisation, infrastructure and stage of exploration. As such, valuing mines and mining companies using a multiple approach has inherent weaknesses. It is for this reason, a DCF approach is typically used for mining companies.

[487] HY 2012 Impairment Review, page 3 [RT_00225317 to RT_00225323]
[488] PwC audit working paper, titled "*Audit Assistance Memo*", dated 8 February 2013, page 11 [PwCUK000002987_0001 to PwCUK000002987_0046]
[489] PwC audit working paper, titled "*Audit Assistance Memo*", dated 8 February 2013, page 11 [PwCUK000002987_0001 to PwCUK000002987_0046]

13.6.18 Consistent with my conclusion, the Project Mercury team set out that:

"***Alternative valuation tools such as EBITDA multiples and Resource multiples were not much help on this occasion given the nature of the assets***. *The proposed Wisco transaction appeared to anchor 40% of Zambeze at $800 million, but this was a non-binding understanding and payment was split into three instalments contingent on signing an agreement, completion of a feasibility study demonstrating a viable project in excess of 30Mtpa ROM and the granting of a mining contract and other relevant approvals, (see below).*

RTE's NPV differed significantly from Riverdale's market value prior to the leaking of the bid. *A sensible criterion for the acquisition of a quoted company, particularly for quoted companies, is that the value added must exceed the proposed acquisition premium. Riversdale's undisturbed share price was ~$9 to $10 per share. The share price probably reflected Benga Stage 1, cash, and out-of-the money development options depending largely on infrastructure solutions (or bid speculation). RTE did not identify any synergies in its paper to justify the premium.*

The significant disparity between the NPV and the share price should have been a warning signal and led us to question the NPV calculation. *This discipline seems to be no longer the predominant view in the company given the Alcan and Riversdale acquisitions. Some within Rio Tinto rationalised the difference in value being due to Rio Tinto's ability to develop the assets faster than Riversdale. However there was no comparison in RTE's IC papers between RTE's assumptions and Riverdale's plans and the additional value created*"[490] [emphasis added].

Conclusion on the information relating to "*potential*" recoverable amount provided to Rio Tinto's auditors

13.6.19 The information provided to Rio Tinto's auditors relating to the "*potential*" recoverable amount of the RTCM Assets as at 30 June 2012 does not affect my conclusion on whether an assessment of the FVLCS of the RTCM Assets would have resulted in a material impairment in Rio Tinto's 2012 Interim Financial Statements. I therefore conclude that:

[490] Paper titled "*Project Mercury – Commercial*", undated, page 14 [RT_00003749 to RT_00003778]

(a) Rio Tinto's Controller's Manual required the FVLCS assessment to be based upon Rio Tinto's own discounted cashflow models, incorporating assumptions which reflected, *inter alia*, "*the best information available*", management's "*best estimates*", and "*the central estimate cash flow*" (which Rio Tinto had defined as being "*neither… unduly optimistic nor pessimistic, but fully and equally reflect*[ing] *both upside and downside*"; and

(b) based on the documents generated by the relevant business units at Rio Tinto, the only way for Rio Tinto to have undertaken an impairment test as at 30 June 2012 which did not result in a material impairment would have been if Rio Tinto had assessed the FVLCS without reference to the best information available, by producing cashflows which were not central estimates (because they would necessarily by unduly optimistic) and by adopting assumptions which were not management's best estimates.

13.6.20 Consistent with these conclusions, the US$5.1 billion presented to Rio Tinto's auditors (which would not result in a material impairment) was not a central estimate cashflow and did not reflect the best available information or management's best estimates.

****

Christopher Drewe

20 December 2019

EXHIBIT 3

UNITED STATES DISTRICT COURT
SOUTHERN DISTRICT OF NEW YORK

SECURITIES AND EXCHANGE)
COMMISSION,)
Plaintiff,) Index No.
vs.) 1:17-cv-7994-AT-DCF
RIO TINTO PLC, RIO TINTO)
LIMITED, THOMAS ALBANESE,)
and GUY ROBERT ELLIOTT,)
Defendants.)
-------------------------------)

REMOTE VIDEOTAPED
DEPOSITION OF CHRISTOPHER DREWE
Wednesday, July 1, 2020

Reported by:
FRANCIS X. FREDERICK, CSR, RPR, RMR
JOB NO. 181154

July 1, 2020

8:42 a.m.

Remote videotaped deposition of CHRISTOPHER DREWE, before Francis X. Frederick, a Certified Shorthand Reporter, Registered Merit Reporter and Notary Public of the States of New York and New Jersey.

A P P E A R A N C E S:

(All counsel and participants present via videoconference and/or teleconference due to COVID-19 restrictions.)

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MICHAEL PINEIRO, Videographer

PROCEEDINGS

THE VIDEOGRAPHER: Good morning, Counselors. My name is Michael Pineiro. I am a certified legal video specialist in association with TSG Reporting, Inc.

Due to the severity of COVID-19 and following the practice of social distancing, I will not be in the same room with the witness but will record this videotaped deposition remotely.

The reporter, Francis Frederick, also will not be in the same room and swear the witness remotely.

Do all parties stipulate to the validity of this video recording and remote swearing that it will be admissible in the court room as if it had been taken following Rule 30 of the Federal Rules of Civil Procedures and the state's rules where the case is pending?

MR. WU: Yes.

MR. RICCIARDI: This is Walter Ricciardi on behalf of Guy --

MR. CONWAY: Go ahead, Walter.

PROCEEDINGS

MR. RICCIARDI: Yeah. This is Walter Ricciardi on behalf of Guy Elliott. Yes.

MR. FLETCHER: This is Scott Fletcher on behalf of Tom Albanese, yes; although, I want to clarify when you say "and subject to the state's rules where this is pending," we're taking this deposition pursuant to the federal rules.

MR. CONWAY: Dean F. Conway on behalf of the SEC, yes.

THE VIDEOGRAPHER: Thank you. This is the start of media number one of the remote recorded deposition of Christopher Drewe in the matter Securities & Exchange Commission versus Rio Tinto Plc, et al. Today is July 1st, 2020. The time is approximately 1:47 p.m. We are on the record.

* * *

C H R I S T O P H E R D R E W E, called as
a witness, having been duly sworn by a
Notary Public, was examined and
testified as follows:
EXAMINATION BY
MR. WU:
Q. Good afternoon, Mr. Drewe. My
name is Aric Wu. I'm one of the attorneys
representing the Rio Tinto defendants in the
case. I'm going to be asking you some
questions today.
Could you state your name and
address for the record, please.
A. Yes. My name is Christopher
Robert Drewe. My current address is 32
Herongate Road, London E12, 5EG.
Q. And are you represented here by
counsel for the SEC?
A. I am, yes.
Q. Have you been deposed before?
A. No, I have not.
Q. Do you understand that you're
testifying under oath?
A. Yes, I do.

C. DREWE

Q. So just -- I know this is a little bit awkward because we're doing things remotely. But particularly because we're not in the same room, it's important that we speak one at a time. Let me ask my question before you answer even if you think you know what I'm about to ask. We need to sort of create a clear record that the court reporter can transcribe.

And if you don't understand one of my questions, just let me know before you answer. Otherwise, I'll assume that you understand the question.

Please answer audibly rather than with a nod or a gesture.

If you need a break at any time just let me know.

Your attorney, Mr. Conway, may object. You'll still have to answer the question anyway unless he specifically instructs you otherwise. But if he objects, let him finish his objection and then answer the question unless he instructs you otherwise.

C. DREWE

Is there any reason such as an illness or physical condition that you can't give truthfully and accurate testimony today?

A. No, there is not.

Q. Okay. And have you taken any medications or other substances that would impact your ability to give truthful and accurate testimony today?

A. No, I have not.

Q. Okay. I'm --

MR. CONWAY: Aric, I'm sorry to interrupt. I just want to clarify one point. I'm here representing the SEC. Mr. Drewe is our witness. I just want to make that clear. I'm not representing him in his personal capacity. I'm here on behalf of the SEC. Sorry.

MR. WU: Thank you.

(Defendant's Exhibit 332, Expert Report of Christopher Drewe, previously marked for identification.)

BY MR. WU:

Q. So, Mr. Drewe, I know you have a

copy of your report in front of you. I'm just going to represent to you that we've marked your report Defendant's Exhibit 332. Okay? If you could just pull out a copy of your initial report. You can either pull out the copy we sent you or use the copy that you have.

A. Okay.

Q. Is this a copy of your initial report dated December 20, 2019?

A. Yes, it is.

Q. And does your initial report contain your complete and accurate opinions as of December 20, 2019?

A. Yes, it does.

Q. And do you still consider those opinions to be complete and accurate as of today?

A. I do, yes.

(Defendant's Exhibit 397, Appendix C to Initial Expert Report of Christopher Drewe, previously marked for identification.)

C. DREWE

BY MR. WU:

Q. Okay. So I'd like to turn to Appendix C of your initial report, which is Defendant's Exhibit 397.

Now, does this Appendix C contain all documents that you relied upon in forming the opinions expressed in your initial report?

MR. CONWAY: Objection, form. Vague.

A. The information that is in Appendix C is the information that I have cited and referred to in my report. I deal with the available information in Section 1.6 of my report. And in Section 1.6 I explain that as part of the documents that have been provided to me, I've been provided with 150- -- or more than 150,000 documents. Also, I've reviewed in excess of 15,000 documents.

The documents that are set out in Appendix C are those documents which I've cited or referred to in my report.

Q. So Appendix C is just a subset of the 15,000-plus documents that you've reviewed?

MR. CONWAY: Objection, form.

A. Appendix C is the information, as I -- yeah, the information that I've cited in my report. The 15,000 -- more than 15,000 documents that I've explained have been reviewed for the purposes of forming my opinions, those I believe were provided separately to the defense. So it was very clear what documents I have reviewed and what documents I haven't reviewed.

Q. And if you reviewed the document but you did not cite it in Appendix C, does it mean that that document is not something you relied upon in forming the opinions in your initial report?

A. A document that is included within the -- let's call it the 15,000 documents -- a document that's within those 15,000 documents isn't included in Exhibit C. They're a document that have been considered in forming the conclusions in my report, but I haven't specifically cited that document in my report.

Q. So under Accounting Guidance, do you see the first subheader in Appendix C?

C. DREWE

A. I do, yes.

Q. And do you see that you list IAS 36 and the IFRS conceptual framework?

A. Yes, I can see that.

Q. Did you rely on any other accounting guidance in forming the opinions in your initial report?

MR. CONWAY: Objection, form. Vague.

A. My instructions to my report were to consider the outcome of an impairment test undertaken in relation to the RTCM asset as of the interim in 2012.

That impairment test would have been required to have been undertaken in accordance with IAS 36. That's the principal standard that I have cited and relied upon.

Clearly, there are lots of other standards within IFRS, which, you know, as a chartered accountant I am familiar with. But for the purposes of doing -- for the purposes of addressing my instructions, the principal standard is IAS 36.

Q. Are there any other specific IAS

C. DREWE

standards that you relied on in preparing the opinions in your initial report?

A. Well, I mean, I think it's important with accounting standards not to think about just one standard in isolation. So, for example, under IAS 36 there is an accounting policy as to how it would have undertaken an impairment test.

Now, there is information in IAS 36 on accounting policies, but, actually, there's another standard within IFRS, IFRS 8, which specifically relates to, amongst other things, to accounting policies. So I wouldn't say that IFRS 8 is irrelevant to the work that I've done. It is relevant. But as I said a moment ago the standard that is -- you know, the principal standard relevant to my work is IAS 36 because that relates to how an impairment test is required to be undertaken by entities preparing financial statements in accordance with IFRS.

Q. And under the heading Other, the first item is the Australasian Code for the Reporting of Exploration Results, Mineral

C. DREWE

Resources and Ore Reserves.

Do you see that?

A. Yes, I do.

Q. Did you --

MR. WU: Sorry. Can we go off the record? I've lost my video feed.

THE VIDEOGRAPHER: The time is 1:57. We are going off the record.

(Pause off the record.)

THE VIDEOGRAPHER: The time is 1:59. We are back on the record.

BY MR. WU:

Q. Mr. Drewe, so we're looking at Appendix C of your initial report. It's entitled Appendix C, Information Relied Upon, right?

A. That's correct. That is the title of the report -- of the appendix.

Q. And if I understand you correctly, what you mean -- what you've listed in Appendix C is not inclusive of everything that you relied upon. It's just documents that are cited in your report; is that right?

A. So as I describe in paragraph

C. DREWE

1.6.3, Appendix C is a list of the information I've relied upon in the preparation of the report.

But as I also explained in Section 1.6, I have, in forming my conclusions, considered, you know, a significant amount of further documents, more than 15,000 documents.

Q. I was talking -- before we got cut off I was looking at the Other category of your Appendix C. And I'd just ask you to look at the first entry for the Australasian Code for Reporting of Exploration Results.

Did you rely on any other mining industry codes in forming the opinion in your initial report?

A. Again, to be clear on what Appendix C is, that's information that is cited in my report. The JORC code is referred to in paragraph 4.6.9 of my report and in footnote 81.

As to what documents I have relied upon in order to address my instructions, well -- and when undertaking an impairment test that is required to be undertaken by

entities issuing financial statements in accordance with IFRS by reference to IAS 36 and the company's stated accounting policies, which are set out in their financial statements.

Q. Mr. Drewe, my question is aside from the JORC code, are there any other mining industry codes that you rely on in forming the opinions in your initial report?

A. Mining codes are not relevant to an impairment test undertaken in accordance with IAS 36. What IAS 36 requires --

Q. Mr. Drewe --

MR. CONWAY: Wait. Mr. Wu --

Q. I just want you to answer my question.

MR. CONWAY: Mr. Wu, wait a minute. Mr. Wu -- Mr. Wu, he's not finished. Please let him finish his answer and then you can ask your next question.

Mr. Drewe, were you finished with your answer?

THE WITNESS: No, I wasn't.

C. DREWE

A. IAS 36 doesn't require in the undertaking of an impairment test reference and reliance upon mining guidelines. You know, it's an accounting test.

Q. Did you rely on JORC, the JORC code in forming your opinions in your initial report?

A. I'm sorry. You broke up a little there. Could you repeat that question?

Q. Did you rely on the JORC code in forming the opinions in your initial report?

A. As I explained a moment ago, I referred to the JORC codes in paragraph 4.6.9 of my report.

That's why it is cited in my report. I have, therefore, included it in Appendix C, as I've explained, in Section 1.6.

The JORC code is relevant -- is clearly relevant to an impairment test because it's relevant to the project evaluation guidelines and, therefore, on the basis of how Rio Tinto undertook its impairment test, which was required to be in compliance with PEG, it is, therefore, relevant to my report. But I

C. DREWE

haven't specifically relied upon it.

(Defendant's Exhibit 403, Rebuttal Expert Report of Christopher Drewe, previously marked for identification.)

BY MR. WU:

Q. Let's look at Exhibit -- what we've marked as Defendant's Exhibit 403, which is your rebuttal report.

Do you have it in front of you?

A. Yes, I do.

Q. Okay. And this is your rebuttal report dated April 3, 2020?

A. That's correct, yes.

Q. And does your rebuttal report contain your complete and accurate rebuttal opinions as of April 3, 2020?

A. As I explain in paragraph 1.2.2 of my report, and I quote, "Where I do not comment upon aspects of the Rio Tinto expert reports in this report, this does not mean that I accept the positions set out within them."

Q. Are there opinions -- do the initial report and the rebuttal report contain

C. DREWE

all the opinions about which you intend to testify at trial or is there other opinions that are not contained in these reports?

A. I'm afraid I don't know the answer to that. I don't specifically know what I'll be asked to testify about at trial. Clearly, I know what's in my -- in this report and in my rebuttal report.

Q. Have you formed any opinions in this case that you've not disclosed in your initial report or rebuttal report?

A. No.

Q. So for your rebuttal report, do you consider the opinions in your rebuttal report to be complete and accurate as of today?

A. Well, as I stated a moment ago, I agree with accurate -- you know, I stand by the conclusions that I've reached in my rebuttal report. In relation to completeness, as I explain at 1.2.2, where I've not commented on aspects of the Rio Tinto expert reports it doesn't mean that I've -- you know, I do accept the positions within them.

C. DREWE

Q. But you have not disclosed any of those disagreements with other reports.

MR. CONWAY: Objection, form.

A. Well, I'm not suggesting that there are lots of opinions that haven't been included within this rebuttal report. What I'm saying is just because it's not included in rebuttal report doesn't mean that if I was asked an opinion on it, I would necessarily agree with the Rio Tinto expert in that regard.

(Defendant's Exhibit 404, Appendix A to Rebuttal Expert Report of Christopher Drewe, previously marked for identification.)

BY MR. WU:

Q. Okay. Let's look at Exhibit 404 which is Appendix A to your rebuttal report.

Do you have that in front of you?

A. I do, yes.

Q. Okay. And this is entitled Appendix A, Information Relied Upon, right?

A. Yes. That's the title of that appendix.

C. DREWE

Q. Okay. Does this contain all of the material that you relied upon in forming the opinions in your rebuttal report?

A. Well, the -- this appendix is explained in paragraph -- in Section 1.5 of my rebuttal report. And, again, this appendix is the information that I have cited -- I have cited in the report.

Q. So there may be additional material that you relied upon in forming the opinions in your report, but they may not be listed here because you didn't expressly cite them in your rebuttal report.

MR. CONWAY: Object to form.

A. In forming my conclusions in the rebuttal report, I, again, considered the 15,000 or in excess of 15,000 documents. And this is the output of my work.

The information included in Appendix A is the information that I've relied upon in the preparation of my report -- I cited in my report.

Q. And outside of the 15,000-plus documents that you reviewed, and the materials

listed in Appendix C of your opening report and Appendix A of your rebuttal report, is there any other material that you relied upon in forming the opinions in your reports?

MR. CONWAY: Objection, form.

Q. You can answer.

A. Well, as we were talking about earlier with -- in relation to IFRS and where there are other standards of IFRS are relevant. My experience of those are the standards is relevant to the work that I've done. But I haven't specifically relied upon it for the purposes of my reports.

Q. Okay. Have you reviewed the initial report of Steven Brice in this matter dated September 20, 2019?

A. I have seen that report, yes.

Q. And have you reviewed Mr. Brice's rebuttal report dated April 3, 2020?

A. Yes, I have.

Q. Are you offering any opinions on the conclusions in Mr. Brice's reports?

A. No, I'm not. My instructions, which are set out in my first report, are to

C. DREWE

consider whether had Rio Tinto undertaken an impairment test at the interim 2012 it would have led to a material impairment. Mr. Brice's instructions are different than that and, therefore, I haven't formed a conclusion on his -- you know, on the instructions that he's been asked to address in this case.

Q. And besides Mr. Brice's reports, have you reviewed any other expert reports in this matter prepared on behalf of the SEC?

MR. CONWAY: Other than the ones he's described?

MR. WU: Yes.

A. No, I haven't.

Q. So you haven't reviewed the report of -- any reports by Albert Metz?

A. No, I haven't.

Q. And you haven't reviewed any reports by Chris Millburn?

A. No, I have not.

Q. Have you reviewed the deposition transcript for any other experts in this case?

A. No, not experts. No.

MR. CONWAY: Objection.

C. DREWE

Q. Have you discussed the substance of any other expert's deposition testimony in this case?

A. I have had discussions with the SEC on -- high-level discussions on the substance of one of the expert depositions.

Q. And which expert was that?

A. That was the deposition of Mr. Millburn.

Q. And with whom did you discuss the substance of Mr. Millburn's deposition testimony?

MR. CONWAY: Objection, form. Vague. I don't know what you mean by "substance."

Q. You can answer.

A. Sorry. Could you actually repeat the question?

Q. With whom did you discuss the substance of Mr. Millburn's deposition testimony?

A. That was with Dean Conway and Fernando Sanchez.

Q. And which of the subject matters

of Mr. Millburn's testimony did you discuss with the SEC?

MR. CONWAY: Objection. This question calls for work product. And I'm going to ask that the witness not answer.

MR. WU: Dean, I don't think I'm asking for anything more than would be, for example, on a privilege log where you have to identify the subject matter.

MR. CONWAY: All right. I guess I'll allow that type of question. But if you start asking specific conversations, specific documents, that sort of thing --

MR. WU: Sure.

MR. CONWAY: -- that's objectionable. Okay?

MR. WU: Sure, okay. Let me ask --

MR. CONWAY: Do you understand the scope of what your answer could be?

THE WITNESS: Well, I'm not familiar with privilege logs. So

C. DREWE

I'll -- you know, I can give a high-level answer and then if it's appropriate for me to provide more detail, then clearly I can do.

BY MR. WU:

Q. Okay. Please do. Thank you.

A. And just to make sure I've got the question right, your question was what in effect topics was it I discussed with the SEC in relation to Mr. Millburn's deposition?

Q. Correct.

A. I mean, the topics at a high level were the overall style of the deposition and the format. It included certain areas around -- valuation approach being one area and other potential topics that came up with -- or were put to Mr. Millburn, which might be relevant to my preparation for today's deposition.

Q. Have you reviewed the report of Professor John Lacy in this case?

A. Yes, I have.

Q. But you're not offering any opinions on the conclusions in Professor

C. DREWE

Lacy's report, right?

A. As I explain in paragraph 1.3.15 of my rebuttal report, in that rebuttal report I haven't responded to any points or opinions set out in Mr. Lacy's report.

And, again, for the avoidance of doubt, it doesn't mean that I've accepted the positions that are set out therein.

Q. Do you hold yourself out as an expert on geology?

A. I don't. And that is why I haven't provided an opinion on matters of geology.

Q. Okay. And in preparing your reports in this case, did you seek the assistance from any experts on geology?

A. No, I didn't. My approach, as explained in my first report, was to rely upon the contemporaneous explanations and presentations and reports and e-mails of Rio Tinto's geologist. You know, I've assumed that they have the necessary experience upon which I can rely.

Q. And you did not seek assistance

C. DREWE

from any experts on geology in interpreting those Rio Tinto documents?

MR. CONWAY: Objection, asked and answered.

Q. It's a yes-or-no question.

MR. CONWAY: If you can answer as a yes-or-no answer.

Q. Mr. Drewe?

A. I didn't -- I can't answer that as a yes-or-no answer. As I've just explained, I relied upon what they contemporaneously explained to, for example, Mr. Morris and Mr. McGurnan, and the inputs that they provided into the models that were being produced at the time. I didn't need someone to help me explain those -- that information for the purposes for which I was using it.

Q. Do you hold yourself out as an expert on mine engineering?

It's really just a yes-or-no question.

A. I don't. And I haven't given any opinions in that regard.

Q. In preparing your reports in this

case, did you seek assistance from any experts on mine engineering?

Again, a yes-or-no question.

MR. CONWAY: Same objection to form.

A. I can't answer that with a yes or no. Again, I relied upon the individuals at Rio Tinto with that experience and I relied upon their contemporaneous analysis, reports, e-mails and presentations.

Q. Did you speak with any of Rio Tinto's experts on mine engineering?

MR. CONWAY: Objection.

Q. That's a yes-or-no question.

A. I didn't think --

MR. CONWAY: Aric, which Rio Tinto experts? Who are you talking about?

MR. WU: In his answer he referenced that he looked at and he relied on materials by experts from Rio Tinto's experts on mine engineering. So I'm asking him if he spoke with any experts from Rio Tinto on mine engineering. It's a yes-or-no question.

C. DREWE

MR. CONWAY: Okay. That he referenced in his prior answer? Is that your question?

MR. WU: Yes. Yes.

MR. CONWAY: Okay.

A. I didn't have conversations with those individuals. I've looked at what they contemporaneously said. And I've also read their depositions provided in this case.

Q. Do you hold yourself out as a coal mining expert?

A. No, I don't. And, again, I haven't given such opinions in this case.

Q. And do you hold yourself out as an expert on coal transportation infrastructure?

A. No, I don't. And, again, I haven't provided such opinions in this case.

Q. Do you hold yourself out as an expert on Mozambique?

MR. CONWAY: Objection, vague.

A. I don't specifically know what you mean by an expert on Mozambique. I'm a chartered account as indicated in Appendix A to my report.

C. DREWE

Q. Have you ever previously prepared an expert report touching on anything relating to Mozambique?

A. Yes.

Q. And what was that expert report?

A. It was an ICC arbitration. It relates to acting for a fund that takes money from various sovereign states and invests those monies in various projects in Africa.

The dispute, which is with the fund manager, is all about two particular investments that were made. The larger of the two was an investment in mining operations in Mozambique -- a different area in Mozambique but in Mozambique. And the dispute is all about the -- under IFRS, the recoverable amounts of those investments for the purposes of calculating the fund manager's fee or remuneration.

Q. Who was the fund manager that you were instructed as an expert by in that case?

A. Well, that's an ICC arbitration. You know, I can't provide details of it. That's confidential.

C. DREWE

Q. Sorry. There's a confidentiality order in this case that protects confidential information so you can disclose it.

MR. CONWAY: Wait a minute, Aric. You don't know what the scope of his agreement is and I object to you making a legal determination on his behalf. We can take this up off the record, but Mr. Drewe is the one who's bound by that agreement, not you. And he needs to make a determination for himself regarding whether he can speak about it or not.

MR. WU: Will you show him a copy protective order during a break in this case and discuss it with him?

MR. CONWAY: Well, I'm not being asked to -- he's aware of the protective order in this case.

MR. WU: What I'm asking is during the break -- what I'm asking is during a break in this case can you discuss with him and then make a determination as to whether or not it can be disclosed?

C. DREWE

MR. CONWAY: I'll have a conversation with him but I'll defer to the witness who is the subject and bound by that confidentiality agreement.

BY MR. WU:

Q. Mr. Drewe, can you disclose the mining project in Mozambique that you referred to?

A. No, I can't. I mean, I have -- there's two reasons I can't. I've got an engagement letter, which is between my firm and with -- and my clients, which means that I can't disclose details of who the client is or -- you know, apart from talking at a very high level about what the case is, I can't disclose that to third parties.

And I've got a contractual requirement that in order to do so I've either got to seek their written approval or I need to be subject to a court order, which would require me to do so.

I've also got an ethical duty and -- as in my membership of the ICAEW, which wouldn't allow me to provide details from one

client to another client, irrespective of what other arrangements might be in place as to whether that client will, you know, give that information to third parties. I simply can't do it.

Q. Can you disclose whether or not this matter is ongoing or is concluded?

A. Yes. It is ongoing.

Q. And sorry. Remind me. Is this an arbitration or a matter in court?

A. This is an arbitration.

Q. And have you prepared expert reports in that case?

A. Yes, I have. I think -- I mean, just to be clear, there's been two parts of that assignment. The first part, which was -- you know, I produced an expert report in draft. The actual expert that is now acting is an audit partner of mine and I'm the forensic lead in that case. So I'm supporting that expert in the case.

Q. So if testimony is to be given, it would be by your colleague, not yourself.

MR. CONWAY: Objection, form.

C. DREWE

A. Yes, that's correct.

Q. Okay. I want to look at Exhibit 395, which is Appendix A to your initial expert report.

(Defendant's Exhibit 395, Appendix A to initial expert report of Christopher Drewe, previously marked for identification.)

BY MR. WU:

Q. Mr. Drewe, is this a copy of your CV?

A. Yes, it is.

Q. Is it a current version of your CV?

A. I mean, it depends what you mean by "current." This was a CV as of the date that I had produced the report. It included --

Q. Okay.

A. As I understand, it required just the matters in which I've testified at that stage. It also included examples of my case experience. It wasn't intended to be an exhaustive list but it was a version of my CV

C. DREWE

on that date.

Q. Okay. Just on your educational history you have a degree in history from the University of Birmingham; is that correct?

A. That's correct.

Q. And what year did you earn the degree?

A. 2005.

Q. And how old are you?

A. I'm 36.

Q. Do you have any post-graduate degrees?

A. No, I don't.

Q. While you were at the University of Birmingham did you study accounting?

A. No. My degree was in history.

Q. And while you were at the University of Birmingham, did you study valuation?

A. Again, my degree was in history.

Q. Have you published any writings in your professional career?

A. No, I haven't.

Q. Have you -- in your professional

C. DREWE

career, have you ever taught any courses?

A. I mean, I routinely do training sessions both within my firm and outside of my firm.

Q. Outside of your firm to whom do you give training sessions?

A. I've given training sessions a number of law firms in London. I've also given training sessions to the -- to the SCA.

Q. And the topic of the training sessions is valuation?

A. I have done valuation. I've also done accounts and accountants. I've done training sessions tailored towards certain of IFRS. And, as you said, I have also done valuation.

Q. And in connection with those training sessions, have you prepared written materials?

A. I guess it depends what you mean by "written materials." We would have had some slides.

Q. And have you -- when is the most -- have you done any of these training

C. DREWE

sessions in the past three years?

A. I'd need to go back and remind myself.

Q. Okay. You're not sure.

Now, you're a chartered accountant, correct?

A. That's correct, yes.

Q. And you're also a Fellow of the Institute of Chartered Accountants in England and Wales or the ICAEW?

A. Yes, I am.

Q. Okay. Did you obtain a license or a certificate when you became a chartered accountant?

A. I obtained a certificate. Yeah, I'm not sure what you mean by license, but you get a certificate on qualification having done the three years' training program and passed all the exams and sit through all of the other things that are required by the ICAEW.

Q. And when did you obtain your certificate as a chartered accountant?

A. That would have been in 2008 I became a member and I became an ACA. And then

in 2018 I became a Fellow, too. I became an ACA.

Q. I'm sorry. You said you became an ACA at some point? What's an ACA?

A. An ACA is a chartered accountant where you've in effect done the exams by the ICAEW. It's a fully qualified member of the ICAEW. And then an SCA is a fellow of the ICAEW.

Q. And how does one become a fellow of the ICAEW?

A. That -- you become a fellow by doing ten years of post-qualification experience, so 13 years in total. Plus keeping up to date and being able to demonstrate that you've kept up to date with continued professional developments. Plus being a -- you know, nothing of disrepute against your name.

Q. And in obtaining your certifications as a chartered accountant, did you study the valuation of mineral assets in particular?

MR. CONWAY: Object to the form.

C. DREWE

A. No. To become a chartered accountant, to become an ACA, the exams are in financial reporting, so they're in IFRS. And then other business tools that many accountants required, one of which is valuation, but also went to management reporting, tax, various other topics.

Q. Okay. And your report says that your -- sorry. Yeah, your report says you're licensed for valuations work at Mazars. Is there some sort of Mazars license that you have or does that just mean you're a chartered accountant?

A. No. That's something issued by my firm. It's explained a little bit at 1.2.3 of my report. But, in summary, it is -- the way my firm works is that in order to do a certain type of work you have to do a license to prevent me from going and doing tax advice because I don't have a tax license because I don't have the relevant expertise necessary.

So only people with a valuations license, any partners or some directors with a valuations license can give opinions on

C. DREWE

matters of valuation.

Q. And who bestows that license? Is it somebody within Mazars?

A. Yes. It's ultimately a matter for our head of risk who sits on our executive, and also for our general counsel. But it's something, for example, that our regulator looks at to -- because it's part of our overall quality management or risk management process.

Q. So on your CV, the first job that appears to be listed is Corporate Services Department of Mazars from 2005 to 2008.

Am I right that you started at Mazars right after receiving your degree from the University of Birmingham?

A. Yes. Subject to a summer job, but, yes.

Q. Sure. So outside of summer jobs, have you ever worked anywhere else other than Mazars?

A. No.

Q. And as a member of Mazars' Corporate Services Department, what were your

C. DREWE

job responsibilities?

A. Within that team -- so I was in that team as I did my training contract so it was the same time as doing my exams. My role was to mostly do external audit on a fairly wide range of clients. I also did a little bit of internal audit and a couple of due diligence assignments. But most of my job was relating to external audits.

Q. And did you do any -- did you work on any external audits of mining companies?

A. No, I didn't.

Q. Okay. And since 2008 you've worked in the Forensics and Investigations Services at Mazars, correct?

A. Yes, that's correct.

Q. Okay. So just to be clear, you've never worked in a mining company?

A. No. I've also been in practice. Principally because it gives me a broad range of experience across sectors and, you know, across different types of clients and different types of issues.

Q. And so I take it you've never --

C. DREWE

MR. RICCIARDI: Excuse me. Excuse me. Excuse me. This is Walter Ricciardi on behalf of Guy Elliott. I move to strike the answer that's nonresponsive. Thank you.

MR. WU: Thanks, Walt.

BY MR. WU:

Q. You've never been employed as a research analyst in the mining sector, right?

MR. CONWAY: Objection, form.

A. I mean, I've always worked in Mazars.

Q. You describe yourself in your report as a forensic accountant. Is it fair to say that forensic accounting focuses on accounting in the context of legal investigations or disputes?

A. Yes, that is an accurate description I think.

Q. And within forensic accounting you focus on contentious valuation?

MR. CONWAY: Objection, form.

A. Apologies. I didn't hear the middle part of that. Can you repeat that,

please?

Q. I guess I'm saying within forensic accounting, the focus of your practice is on contentious valuation?

A. Yes. Yes, it does. And, you know, I explain on my CV some examples of what I mean by contentious valuation. So it's a pretty -- still a pretty wide range within that.

Q. Okay. And you sometimes act as an independent reviewer for non-contentious valuation, correct?

A. Yes. That's correct.

Q. Okay. What is an independent reviewer for a non-contentious valuation?

A. I mean, a non-contentious valuation is where a valuation has been done that doesn't relate to a dispute. So it might be for M&A purposes or restructuring purposes, for example.

Valuation assignments -- again, one of our risk management processes is to have an independent reviewer, a second partner, look at those types of work. So I'm

not the main partner responsibility for the engage; instead I'm there as a second pair of eyes, you know, reviewing the valuation as part of the risk management process.

Q. And have you ever been an independent reviewer for a non-contentious valuation of coal assets?

A. Not that I can recall.

Q. Okay. And approximately what percentage of your practice is spent on non-contentious valuation?

A. I mean, it obviously really does fluctuate significantly. I would suggest that I do between one every two weeks and one every four weeks would be my guess. But, you know, that's not exact. I would need to go and look at records if you wanted a precise estimate.

Q. Okay. That's okay.

I'm just going to ask you a few more questions and then we can take a break, okay?

You say in your initial report that you consider it sometimes helpful to refer in your expert reports to international

valuation standards or IVSs.

Do you recall that?

A. Yes, I do recall that.

Q. Okay. And can you explain why you consider it sometimes helpful to refer in your expert reports to IVSs?

A. Well, one of the reasons -- the principal reason is that with many valuations there isn't a specific manual on how to do a valuation. So there's no specific mandatory set of steps that need to be followed, which is obviously very different when you're looking, for example, at how something should be accounted for when you've got IFRS or whatever the accounting framework is, which tells you what the requirements are.

And so I certainly find it being helpful when I'm acting as an expert to sometimes refer to what the IVSC has produced simply because often, you know, if you've got two valuation experts it can be something that you can immediately hopefully agree on that's the broad concepts that are set out in the IVSC are hopefully going to be agreed by most

C. DREWE

valuation practitioners.

Obviously, what it doesn't do is to, you know, provide that rule book as to how the valuation should be undertaken.

And in the context of the assignment here, actually, it's IAS 36 that's the relevant standard rather than the IVSC.

Q. I see. So here were you guided by the IVS in preparing your opinion in this report -- in your reports?

MR. CONWAY: Objection. Asked and answered.

A. I wouldn't describe it like that, no. I mean, the publications of the IVSC is -- probably guides my experience as a valuations practitioner. So what I'm guided on -- what I've been guided by in this assignment is instead the requirements of IAS 36, together with what Rio Tinto set out in its accounting policies as being its methodology for doing valuation.

Q. So would you characterize IVSs as guidance or standards or a mix of both?

MR. CONWAY: Objection, form.

C. DREWE

Lacks foundation.

Q. You can answer.

A. Well, I mean, literally the 'S' in IVS is the word "standards." But these standards are not mandatory. And when undertaken in an impairment test, certainly at the time, IVS's weren't relevant.

But in my experience, it's helpful when doing an expert report, sometimes particularly if you've got judges or tribunals who are unfamiliar with valuation, it's helpful for them to look at because it's a high-level overview of some of the valuation concepts.

But, as I said a moment ago, in this case, my -- the guiding light was IAS 36 and what Rio Tinto disclosed the uses of its accounts and its financial statements as to how it undertook impairment tests.

Q. I think you said earlier that --

MR. CONWAY: Sorry, Aric. Would this be a convenient time to take a break or do you have just a few more questions?

C. DREWE

MR. WU: I just have a couple more questions on this and then we can take a break.

MR. CONWAY: Okay, great.

BY MR. WU:

Q. You said that the IVS doesn't provide a rule book for valuations. Is that because valuators have to apply their own professional judgment in each case?

A. Well, I mean, it really depends on what the purpose of the valuation is. And I think this is exactly what the IVS's say and it's exactly why they exist so there's no confusion on this.

There are certain valuations for which there are certain requirements and, you know, financial reporting valuations in an impairment test is a really good example of that.

There are other valuations where, you know, a valuation for M&A, frankly, the -- you know, that's up to the -- it's up to the valuations practitioner to do what they think is sensible.

C. DREWE

But, you know, as I explained a moment ago, my experience as acting as an expert is that it's helpful when discussing valuation concepts with individuals who are not necessarily familiar with them to refer to the IVSC.

But in this case, that's not -- you know, I haven't needed to rely on it. I haven't particularly needed to refer to it. Apart from this section of the report, I don't think I particularly referred to the IVSCs because there are very clear requirements in IAS 36 and there is Rio Tinto's own stated accounting policies on how it undertakes impairment tests.

(Defendant's Exhibit 441, International Value Standards dated 2011, previously marked for identification.)

BY MR. WU:

Q. Let me just -- I just want to show you one document and just want to make sure we've been talking about the same thing. It's Defendant's Exhibit 441. And you can see it

and our screen. Does this appear to be what
you know as the International Value Standards?
In this instance it's dated 2011.
A. Yes. That's right. I believe
there's been a new version since then but I
think that's the version that would have
applied at the time.
Q. Okay. Thank you.
MR. WU: Why don't we take a break
and can we go off the record.
THE VIDEOGRAPHER: Sure. The time
is 2:51. This is the end of media
labeled number one. We are going off
the record.
(Recess taken.)
THE VIDEOGRAPHER: This is the
start of media labeled number two. The
time is 3:06. We are back on the
record.
BY MR. WU:
Q. Mr. Drewe, in your professional
career, how many assignments have you
undertaken in the mining sector?
MR. CONWAY: Objection, form.

C. DREWE

Vague.

A. I mean, I'd have to go back over my 15 years to try and work that out. I don't have a number sat here today. A number of assignments that I have worked on in the energy and mining sector are included in my -- in my CV in Appendix A to my first report.

Q. Would you say the number of assignments is less than ten or more than ten?

MR. CONWAY: Objection. Asked and answered.

A. I would say more than ten.

Q. Okay. And how many of your assignments in the mining sector have involved a coal asset?

A. I think I would need to head back. I mean, fundamentally from the work that I do, which is looking at it more from a valuations or financial reporting perspective, the actual -- the actual mineral being mined is not really the determining factor because, as we've already talked about, that's not what my area of expertise is. So I'm not entirely sure. I would need to look.

C. DREWE

MR. RICCIARDI: Objection -- excuse me. Excuse me. I meant to strike -- this is Walter Ricciardi on behalf of Guy Elliott. I move to strike the answer as nonresponsive. Thank you.

BY MR. WU:

Q. Would you say the number of assignments that you've undertaken in the mining sector that involved coal assets is more or less than five?

MR. CONWAY: Objection. Asked and answered. He's told you that he'd have to go back and look.

Q. You can answer -- if you can answer greater or less five you can answer.

MR. CONWAY: Objection. If you can answer that question.

MR. WU: Are you instructing him not to answer?

MR. CONWAY: No. No, I'm making my record, Aric.

BY MR. WU:

Q. Okay. You can answer.

MR. CONWAY: He's given you --

C. DREWE

okay. Go ahead. Go ahead.

A. I don't know. I don't know.

Q. Do you know if it's more or less than ten?

MR. CONWAY: Objection. Asked and answered several times.

Q. You don't know.

A. I don't know what the answer is.

Q. Did you prepare the December 20, 2020 report in its entirety?

A. It depends what you mean by did I prepare it in its entirety. I reviewed every single word in there. The opinions in there are my opinions and mine alone.

But as I made clear in paragraph 1.7.1, you know, I had a team of individuals who helped me in undertaking my work.

Q. And about how many Mazars employees assisted you on your initial and rebuttal report?

A. It depends on where in the process. For example, one of the initial things was to do the document review and there was a team that specifically worked on that.

C. DREWE

Then, in relation to my report, I -- there were I guess what you'd call, in addition to me, probably three core people. But then there were other individuals who assisted at various points in time.

Q. Okay. The three core people that assisted you on your report, how did they assist you? Did they draft any portions of your report?

A. So they all had different roles under my direction and under my supervision. Do you want me to talk you through the three roles?

Q. I just want to know did they draft any portions of your report?

A. There were sections within my report, yes, that were -- the initial draft would have been undertaken or were undertaken by other individuals, which I would then review and either provide comments and markup or I would in effect start again and rewrite myself. Again, for the avoidance of doubt, these are my opinions.

Q. And who are the three core people

C. DREWE

that assisted you?

A. There was Christopher McDonald who is manager in my team. He was -- his principal role was on the report and to do the initial draft, having first agreed with me what need to go into those drafts. He would do the initial drafts for my review.

There was a manager called Dagmara Obcozska-Jranilo, who worked on a lot of the financial model aspects. Again, under my careful direction and supervision.

And then there was a junior individual called Lucy Enfante, who did some of the more basic analyses, put together some of the graphs, some of the more basic areas of the work. Again, under my careful supervision and instruction.

Q. Thank you. What was the name of the individual who assisted you with the financial modeling? I didn't catch his name.

A. Yeah. It's -- the first name is Dagmara, D-A-G-M-A-R-A. And then the surname is -- I might get the spelling wrong here, I apologize -- O-B-C-O-Z-S-K-A hyphen

C. DREWE

J-R-A-N-I-L-O. I think that's right.

Q. Okay. Why don't we use his first name, if that's okay.

A. It's a lady. But, yes, that fine.

Q. Oh, sorry. Why don't we use -- is Dagmara, is she a specialist in mining asset valuation?

MR. CONWAY: Objection, form.

A. She worked -- she works in the global infrastructure finance team at Mazars, which is a part of my service line but sits directly under my -- in my team.

Q. Right. But does she have a specialty in mining asset valuation?

A. That team, as its name suggests, has a specialty in producing -- so they audit and they build models for energy and infrastructure projects.

So, I know, for example, that they've done -- in the last few years they've done over 50 models that they've either built or provided to people including lots of mining assets. You know, one of their areas of speciality, but how many of those Dagmara has

worked on, I don't know. You'd have to ask her.

Q. Prior to this assignment, do you know if Dagmara has done any valuations of coal assets?

A. As I said, I mean, I don't specifically know about her experience. But the global infrastructure finance team, you know, they're one of the market leaders in producing financial models and providing training to individuals.

So it's -- but I don't know about her specific experience. She was a --

MR. RICCIARDI: Object. Hold on. Hold on. This is Walter Ricciardi on behalf of Guy Elliott. I move to strike the answer as nonresponsive. Thank you.

BY MR WU:

Q. Mr. Drewe, I think you've told us that the SEC provided Mazars with approximately 150 documents in connection with this assignment, right?

A. Yes. That is correct. I think it's slightly more than that, but, yes.

C. DREWE

Q. And --

MR. CONWAY: Aric, please let him finish his answer. Mr. Drewe, were you finished answering the question?

Q. Okay. Can you --

MR. CONWAY: Wait a minute, Aric. I think he wasn't finished. Mr. Drewe were you finished with your answer?

A. So the only thing I was saying was that I think it's more than 150,000 but, yeah, I'm happy to use that figure of 150,000 to make things easier.

Q. And your report says that you and Mr. Brice used an e-discovery platform to undertake searches and reviews of those documents, right?

A. Yes, it does. My approach in that regard is at 1.6 of my report for reference.

Q. Okay. What was the e-discovery platform that you used?

A. The name of the platform is called Access Data.

Q. And did you personally access the platform?

C. DREWE

A. Yes, I have access to the platform.

Q. Okay. And did you come up with the search terms to run on that platform?

MR. CONWAY: Objection, foundation.

A. I had a significant role in coming up with those -- coming up with those search terms. I mean, determining what key word searches to use is an iterative process. It's not something that I just say, Okay, well, these are the key word searches, let's run them and then we'll review the documents. As I say, it's an iterative process. If you narrow the population too much, then you haven't looked at enough documents. If the search terms aren't right and you don't -- and, you know, there's 140,000 documents in there, it's still not much help.

So with those key word searches there was an initial draft lift, which I inputted into and ultimately signed off.

After those were run, it was adjusted as appropriate. And then as the

document review process took place, and further areas were identified in which to -- in which I thought further information was needed, then further searches would be run.

So I was, as said, pretty key in the key word search determination.

Q. And you personally reviewed in excess of 15,000 documents?

MR. CONWAY: Objection, foundation.

A. No, I have not reviewed all of those personally. I reviewed many thousand documents. But as I explain in 1.7.1, I've had a team helping me undertaking not just the modeling side but also helping me on the document review.

Q. How many people were on the document review team approximately?

A. There were three -- three core people. But then, you know, people were -- you know, other people would help out where needed. For example, Lucy did some document review but she wasn't someone who worked on that document review throughout.

C. DREWE

Q. Okay. What did you do to prepare for today's deposition?

A. I have read over my report a number of times. Re-familiarized myself some of the documents that I relied upon. Re-familiarized myself with the various financial models. I have, you know, had discussions with the SEC and with members of my team.

Q. And in preparation for today's deposition, did you review any documents that you had not previously reviewed when preparing your reports?

A. The only document that I'm just contemplating is the exhibit that you provided me with in the last -- in the last 48 hours.

But I believe that -- I believe that all of those, as far as I understand it, were included within the 15,000 documents that we provided to the defendants.

Q. Prior to this case have you ever served as an expert for the SEC?

A. It depends exactly what you mean by "this case." Mazars were consulted as

C. DREWE

consultants in the investigation phase of this case.

Q. And did you personally work on that consulting engagement prior to the filing of this lawsuit during the investigation phase?

A. Yes, I did.

DI Q. And what work did you do during the investigations phase?

MR. CONWAY: I'm going to object to this line of questioning based on work product and instruct the witness not to answer. Consulting assignment is separate from his testifying expert work and it's covered by the work product privilege.

MR. WU: So you won't let him answer, for example, whether he did any valuation work?

MR. CONWAY: He was retained as a consulting expert for the SEC and to the extent that you're asking questions regarding the work that he did within the context of that role, the SEC's

C. DREWE

position is that that is work product.

MR. WU: Let me try out this question again and let me know if you object.

BY MR. WU:

DI Q. As part of your work during the investigations phase, did you review any memorandum or analyses that the SEC enforcement staff provided to the SEC Commission?

I'm just asking for a yes-or-no answer. Not to disclose the content.

MR. CONWAY: I'm going to object to that question to the extent that it calls for information regarding his consulting work for the SEC. You're free to ask any questions you want regarding what he reviewed, what he did, who he talked to, when he talked to them, with regard to his work as a testifying expert.

But to the extent that you're asking questions regarding work that he did for the SEC in connection with this

C. DREWE

consulting role, I'm taking the position that that's work product.

MR. WU: You're not going to let him answer.

MR. RICCIARDI: Excuse me -- okay. I was just going to say you're instructing him not to answer the question?

MR. CONWAY: Right. To the extent that he's asked questions that invade the work product privilege, yes.

MR. WU: Well, let me state the question again and, Dean, just let us know if he can answer or not.

BY MR. WU:

Q. Did you review any memorandum or analyses that the SEC enforcement staff provided to the SEC Commission?

MR. CONWAY: Yeah, I'm going to -- same objection. You're free again to ask him within the context of --

MR. WU: Are you instructing him not to answer this question?

MR. CONWAY: Can I finish my

C. DREWE

comment without being interrupted, please?

MR. WU: You're not responding to my question.

MR. CONWAY: Can I finish without being interrupted, please?

Well, I'm not under oath and taking a deposition. I'm telling you that to the extent you're asking questions regarding what he did, what he reviewed in connection with his work as a consulting expert for the SEC, which the SEC takes the position it is covered by the work product, then the answer is yes.

If you want to ask him questions regarding whether he reviewed that type of memoranda in connection with his expert testimony, feel free to do so. And any other question that you have related to things that he reviewed in connection with his role as a testifying expert.

C. DREWE

BY MR. WU:

Q. Have you ever reviewed any such a memorandum or analyses at any point in time?

A. Could you -- sorry. I know you've asked this a couple of times. What's the particular document you're asking me about?

Q. Have you ever reviewed any memorandum or analyses that the SEC enforcement staff has provided to the SEC Commission.

It's a yes-or-no question. And Mr. Conway is saying that you can answer to the extent you did such a review in connection with your role as a testifying expert in this case.

A. Okay. I'm not entirely sure what that document is. Not that I can recall.

MR. CONWAY: And, Aric, do you have a specific memoranda or analysis that you're thinking of? I mean, that's a very vague question. Is there something in particular?

MR. WU: Sure. Sure.

MR. CONWAY: Okay.

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BY MR. WU:

Q. Mr. Drewe, have you ever reviewed any recommendation from the SEC enforcement staff to the Commission, the SEC Commissioners, seeking authority to file this lawsuit that we're here on today?

MR. CONWAY: Okay. Just one second. You're asking in connection with his work as a testifying expert; is that right?

MR. WU: I'm asking ever. But you can limit it however you think you see fit.

MR. CONWAY: Okay. Within your role as a testifying expert, can you answer that question?

A. Again, I'm not entirely sure -- I don't recall reviewing it. I don't know entirely what that document would look like. So not to my recollection.

MR. RICCIARDI: Excuse me. Just to clarify, Dean, you're instructing him not to answer to the extent that he reviewed it in connection with the work

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he did prior to being appointed as expert.

MR. CONWAY: Walter, I'm simply making the objection that to the extent he's asked questions related to things that he reviewed or things that he did in connection with his role as a consulting expert, that we believe that that is covered by the work product privilege.

MR. RICCIARDI: But he's now a testifying expert and so if he reviewed that --

MR. CONWAY: Right, right. Right. And I made that distinction. The distinction I made is if Aric wants to ask him that question in connection with his work as a testifying expert, then that's fine.

MR. RICCIARDI: But it's still in his head. If he reviewed it prior to being designated as an expert, it's still in his head. You're not going to let him answer with regard to what's in

his head unless it went into his head after he was designated as a testifying expert. Just so we're clear as to what you're instructing him not to answer.

MR. CONWAY: Yeah, I think I've made my point on the record. And, you know, this may be subject to further discussion. But, again, in the role of a consulting expert, the SEC's position is that that work is covered by the work product privilege.

You can ask him in connection with his work as a testifying expert did he review such document, that's fine. And I think he was just asked that question.

MR. WU: Okay.

BY MR. WU:

Q. Mr. Drewe, did you review any draft of the Complaint before it was filed on October 17 of 2017?

MR. CONWAY: Again, are you asking before he -- well, if you're asking -- again, same objection. If you're asking him in connection with his role as a

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consulting expert, same objection. If you're asking him in his role as a testifying expert, then he can answer.

MR. FLETCHER: Dean, what is your instruction? I'm not clear whether you're instructing him not to answer or you're just lodging an objection. Can you be clear about that?

MR. CONWAY: Sure. I'm instructing him not to answer to the extent that he reviewed a document or had a conversation in his role an consulting expert to the SEC.

To the extent that the question is phrased within the time frame of his services as a testifying expert then he can answer.

MR. FLETCHER: So just to be clear, you are instructing him not to answer any question about the facts or documents that he considered prior to becoming a -- retained as a testifying expert. Is that your position?

MR. CONWAY: Yes. The documents

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that he relied on and reviewed have been set forth in his report.

MR. FLETCHER: Right. And you are instructing him not to answer as to facts or documents he's considered prior to being retained as a testifying expert. Do I have that correct?

MR. CONWAY: I think I've made my objection several times and I'll stand on it. He is not to testify regarding things within the ambit of his role as a consulting expert.

MR. FLETCHER: All right. And that's an instruction or an objection?

MR. CONWAY: Look, why don't we take this question by question. I think these are hypothetical questions.

Aric, do you have a question you want to ask him?

MR. WU: I had a pending question. I had a pending question and -- before we had this colloquy.

BY MR. WU:

Q. Did you review any draft of the

SEC Complaint before it was filed on October 17, 2017?

MR. WU: Can he or can he not answer, Dean?

MR. CONWAY: Aric, why don't -- well, if he reviewed the Complaint within the -- a draft of the Complaint within the ambit of his role as a testifying expert, then he can answer the question.

MR. WU: But otherwise he cannot.

MR. CONWAY: Right.

MR. WU: Correct?

MR. CONWAY: Yes.

BY MR. WU:

Q. Mr. Drewe, when were you engaged as a testifying expert? On what date were you engaged as a testifying expert?

A. It was toward -- I'm sorry. I'm getting a bit of background noise. Now it's gone.

It was towards the end of 2018.

MR. WU: I have a yes-or-no question. Dean, you just have to say if

he can answer or not.

Q. Did you speak with any SEC employees during the SEC investigation?

MR. CONWAY: He can answer that.

A. Yes.

MR. WU: Same thing. Dean, you tell us whether he can answer.

DI Q. What were your instructions during the SEC investigation?

MR. CONWAY: Again, Aric, this is, I mean, work product.

MR. WU: Just say yes or no so we have a record and we'll take it to the Court. We just need a clean record of what you're allowing him to answer and what you're not.

MR. CONWAY: Can we go off the record and have a conversation rather -- it might be more efficient that way.

MR. WU: I just want -- for this question, I just want on the record whether you're allowing him to answer or not.

MR. CONWAY: What the nature of

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the conversations were --

MR. WU: No, no. I said what were your instructions during the SEC investigation.

MR. CONWAY: In his role as a consulting expert.

MR. WU: If he was -- if that's what he was during the investigation, yes.

MR. CONWAY: Again, it's the same objection. He was retained as a consulting expert.

MR. WU: Okay.

MR. CONWAY: He was retained as a consulting expert. So to the extent you're asking questions that would invade the work product privilege, then the objection stands.

MR. WU: You mean you're telling him he cannot answer.

MR. CONWAY: Aric, you're --

MR. WU: You're telling him he cannot answer the question.

MR. CONWAY: If you're asking the

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question about privileged conversations that he had with the SEC in his role as consulting expert, then the answer is no.

MR. WU: Okay. So let's move on. Let's look at Exhibit 428.

(Defendant's Exhibit 428, Expert Accountants' Report of Steven Brice and Christopher Drewe dated 6 September 2017, previously marked for identification.)

MR. RICCIARDI: Can I just make sure I understand one thing. So you're going to instruct him not to answer with regard to any documents he was shown in connection with his role prior to being engaged as an expert. Is that right?

So to the extent the question is what documents he reviewed as part of his pre-testifying expert phase of his engagement, you're going to instruct him not to answer what documents he reviewed in that role. Just so we're clear.

MR. CONWAY: To the extent you're

asking questions regarding his role as a consulting expert, the SEC's position is that that is work product. You're free to ask him in his role as a testifying expert what documents he reviewed. I mean, he's -- you know, I mean, you're free to ask. You're free to go into that, as I think I've said before.

MR. RICCIARDI: But not documents he reviewed prior to being designated as a testifying expert, correct?

MR. CONWAY: Again, to the extent he was retained as a consulting expert, we're taking the position that that's covered by the work product privilege.

MR. RICCIARDI: Thank you.

BY MR. WU:

Q. Mr. Drewe, Defendant's Exhibit 428 is a copy of the FCA report that you and Mr. Brice prepared, right?

A. Yes, it is.

Q. Sitting here today, do you stand by the opinions in the FCA report?

A. I do, yeah.

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Q. And in the FCA report you and Mr. Brice relied on a report from Dr. Neil Rigby from SRK Consulting, right?

A. Yes.

Q. And Dr. Rigby is a mining engineer, right?

A. I would need to check his CV about -- yeah. I think that might be the case but I would need to check his CV.

Q. Okay. In your work for the SEC in this case did you rely on Dr. Rigby's report?

A. No, I didn't. As we talked about earlier on today, I relied on the contemporaneous mining experts of Rio Tinto as reflected in their contemporaneous e-mails, presentations and reports.

Q. Okay. In this case you were instructed by the SEC to address the question of whether there would have been a material impairment of RTCM if Rio Tinto had calculated a formal estimate of recoverable amount at half year 2012; is that right?

A. Sorry. Were you reading that from somewhere?

Q. Why don't I do this. In Section 1.3.4 of your report you say that your instruction was to address the following question: "If Rio Tinto had undertaken an impairment test in relation to RTCM as after 30 June 2012 would it have led to a material impairment."

Those were your instructions, right?

A. Yes. Apologies. I thought you were talking about the FCA report. Yes, those were my instructions in the SEC case.

Q. Okay. And there when you use the phrase " impairment test" you're not referring to the assessment of whether an impairment indicator exists under IAS 36, right?

A. That's correct. I'm simply looking at what the outcome of an impairment test would have been.

Q. Right. And so, in other words, calculating a formal estimate of recoverable amount.

A. Yeah. Applying the concepts of

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IAS 36 and applying Rio Tinto's stated accounting policies, among other documents that I referred to, considering whether an outcome of an impairment test would have led to a material impairment.

Q. Okay. And just using your phrase "impairment test," if there's no impairment indicator, no impairment testing is required under IAS 36, right?

A. Well, at the interim that would be right. That's not --

Q. Okay.

A. That's not a complete -- that's not a complete explanation as to when an impairment test is required.

Q. All right. But in a half year interim report, which is what we're here -- the subject of your opinion, at half year 2012, if there was no impairment indicator, do you agree that no impairment testing, the way that you used that phrase, was required?

A. Yeah, I -- I mean, if I can put it in my own words, if there was no requirement to be an impairment test, then you don't need

to do an impairment test.

Q. Okay. Do you know what I mean by impairment indicator?

A. Yes.

Q. Okay. So you're not offering an opinion on whether an impairment test was required at half year 2012, right?

A. No, I'm not.

Q. Okay. So you've constructed many valuation models in your career, right?

A. Yes, I have.

Q. Okay. For this assignment you did not construct your own valuation model; is that right?

A. Well, you've got what I referred to as the Drewe model, for example, which is my model.

Q. Is that a new DCF model or is that something based off a Rio Tinto model?

A. It's a new model in the sense that it takes eleven key models that I identify in my report and puts them all into one place so that they can be easily analyzed and the various assumptions and changes in assumptions

be considered.

Q. Okay. Let me just be clear. You didn't create a new DCF model. Is that fair to say?

A. It depends what your reference to "new" is. Is it -- it's a new spreadsheet. We started a spreadsheet and we've taken the inputs -- you know, a DCF model is not -- it's simply math. We've taken the inputs from the various key models as I've defined them in my report and put those into a new model so that those inputs and the outputs can be easily compared.

So that is a new financial model but it is based upon the models, the key models, Rio Tinto had produced.

Q. You took a key -- you took key models and made adjustments; is that correct?

A. No, the Drewe model is the key -- there are adjustments there because the Drewe model is simply taking the eleven key models and putting them all into one spreadsheet is another way of explaining it.

Q. Well, let me ask you, in your

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rebuttal report you say: "I would be required to produce an entirely new DCF model, including a revised mine planning coal chain solution and I do not have the information to do so."

Did you or did you not prepare a new DCF model as part of your assignment in this case?

A. As I just explained, I haven't done a new DCF model using -- let's call it Drewe assumptions. That's not what I've done.

What the Drewe model is, it takes the existing models that exist and puts them all into one place. It's the way that I was able to analyze the movements and the assumptions between one model and the next model and analyzed how that movement in the assumption impacted what the computed value was.

But, as I said, those are Rio Tinto's models that I've put all into one place.

Q. Okay. If I use the term FVLCS do you understand I'm using referring to term

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fair value less cost to sell?

A. Yes, I do.

Q. And in half year 2012 you applied what you called Rio Tinto's contemporaneous valuation guidelines, right?

A. Could you point me to a specific part of the report that you're talking about?

Q. Sure. Section 4.5. It's entitled Rio Tinto's Contemporaneous Valuation Guidelines.

A. Yes.

Q. Okay.

A. Okay, yeah.

Q. Okay. And those contemporaneous valuation guidelines included Rio Tinto's project evaluation guidance or PEG?

A. Yes, that's correct.

Q. And they also included Rio Tinto's Controller's Manual?

A. I think the Controller's Manual is -- I wouldn't describe it as valuation guideline. The Controller's Manual, which I think I referred to in Section 5, not in this section here if I remember rightly, the

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Controller's Manual explains how Rio Tinto's controllers and their accountant prepared Rio Tinto's financial statement in accordance with IFRS and also the other financial reporting requirements that they had.

This section, Section 4.5 of my report, is referring to the -- referring to PEG. But then also there are a couple of other -- there's the PEG valuation guidelines that I refer to, for example, at paragraph 4.5.1(a).

Q. So outside of PEG and TEG, are you relying on any other Rio Tinto contemporaneous valuation guidelines?

A. I think it depends where you draw the line on what's classified as valuation guidelines. The work that I've done is to consider the outcome of an impairment test and at the start of Section 5 I've listed what the key documents are for considering that impairment test. Again, you know, obviously the accounting policies in Rio Tinto's financial statements which explain to the user's of the financial statements how the

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impairment test should be undertaken.

Now, that is -- I wouldn't describe that has a valuation guideline. Actually, that's what -- it's not a guideline. It's what Rio Tinto is saying that they do. It does relate to a valuation because it's relating to an impairment test.

So it depends whether you would include that or not within your definition of the contemporaneous valuation guideline.

Q. Do you agree with me that PEG and TEG are not publicly-available documents?

A. I don't actually know. I suspect they're not, but I don't know.

Q. Would you agree that they're prepared by Rio Tinto personnel?

A. Yes. I believe that to be the case.

Q. Okay. And they weren't prepared, for example, by a recognized authority in the field of valuation?

A. The Controller's Manual.

Q. No. PEG and TEG.

A. Okay. They are prepared by people

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that understand valuation. Was that your question? Or that they weren't?

Q. No. They were not prepared by a recognized body in the field of valuation.

If it helps, let me give you an example. By a recognized authority I mean, for example, by the IVSC, the body that prepared the International Valuation Standards.

A. Okay, yeah. Apologies. Yeah, I believe they were, as far as I understand it, prepared internally Rio Tinto, not by a valuation body.

Q. Okay. Are you familiar with the South African Mineral Asset Valuation code? And I might call it SAMVAL, S-A-M-V-A-L code.

A. I have come across it before. It's not something that I've considered for this assignment.

Q. Okay. Are you familiar with the CIMVAL standards and guidelines for valuation of mineral property? By CIMVAL I mean C-I-M-V-A-L.

A. Again, I have come across it

before. It's not relevant to the work that I've done because what I'm doing is an impairment test in accordance with IAS 36 and Rio Tinto's stated accounting policies. And that mineral valuation guidance is not -- it's just not relevant to that.

Q. Are you familiar with --

MR. RICCIARDI: Excuse me. Excuse me. This is Walter Ricciardi on behalf of Guy Elliott. I move to strike the answer as nonresponsive to the question. Thank you.

BY MR. WU:

Q. Are you familiar with the V-A-L-M-I-N code, V-A-L-M-I-N?

A. Again, I have come across it previously but for the purposes of this assignment, it's not something that I have applied because I am doing -- I'm considering the outcome of an impairment test in accordance with IAS 36 and Rio Tinto's stated accounting policies in its financial statements.

MR. RICCIARDI: Excuse me. This

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is Walter Ricciardi on behalf of Guy Elliott. I move to strike the answer as nonresponsive to the question. Thank you.

BY MR. WU:

Q. Are you familiar with the SME standards and guidelines for valuation of mineral properties?

A. I'm sorry. What was the acronym there that you used.

Q. SME. It stands for Society for Mining, Metallurgy and Exploration.

A. Okay. I don't -- I don't specifically recall having seen that before on other assignments. I may be wrong. I'd have to go and check.

But, again, my instructions in this case were to consider the outcome of an impairment test as at 30 June, 2012. And that is in accordance with IAS 36 and Rio Tinto's stated accounting policies in its financial statements.

MR. RICCIARDI: This is Walter Ricciardi on behalf -- excuse me.

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Excuse me. This is Walter Ricciardi on behalf of Guy Elliott. I move to strike the answer as nonresponsive to the question. Thank you.

BY MR. WU:

Q. And are you familiar with the IMVAL test, I-M-V-A-L, which I understand stands for International Mining Property Valuation Standards.

A. Again, I think I've come across that in other cases. But I didn't consider it for the purposes of this assignment because my instructions were to consider the outcome of an impairment test as at 30 June 2012. And that is in accordance with the IAS 36 and Rio Tinto's stated accounting policies as set out in their financial statements.

MR. RICCIARDI: This is Walter Ricciardi. I move to strike the answer after "but" because the question was was he familiar with it and everything following "but" was not responsive to the question and I move to strike it as nonresponsive to the question. Thank

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you.

BY MR. WU:

Q. Mr. Drewe, I take it from your answers that in estimating the FVLCS of RTCM at half year 2012 you did not rely on any mineral asset valuation standards, correct?

A. In considering the outcome of an impairment test I considered the requirements of IAS 36 and Rio Tinto's stated accounting policies, which is how an impairment test should be undertaken. These valuations of mineral properties standards that you've referred to are non-relevant to that consideration.

MR. RICCIARDI: I move to strike the answer as nonresponsive to the question. Walter Ricciardi on behalf of Guy Elliott. Thank you.

BY MR. WU:

Q. Turning back to PEG, you don't have any personal experience with Rio Tinto's interpretation of PEG, correct?

A. No, I don't have any personal experience of applying Rio Tinto's PEG.

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Q. Okay. And what is your understanding of when PEG applied to Rio Tinto's projects?

A. According to PEG, and if you look at paragraph 4.5.2, the purpose of PEG is to define Rio Tinto's project evaluation methodology. It should be used when valuing both new capital projects and existing businesses.

So it's clear from PEG certain of the times when it is required. But also according to the Controller's Manual, in the Controller's Manual in relation to impairment tests it says that impairment tests should be undertaken in accordance with PEG except to the extent that deviations are required because of the requirement of IFRS.

Q. Now, you say in your report that PEG is not inconsistent with IVS. Do you remember that?

A. I do recall it. If you give me a paragraph reference it might help.

Q. That's okay. I'm just going to ask you. But you don't say it contains all

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the IVS standards, correct?

A. I am -- I mean, the reason I've said not inconsistent is because, I mean, I haven't been instructed to and I haven't done a comparison between the requirements of PEG and the requirement of International Valuation Standards. But having read PEG and knowing what the IVSs are, you know, there was no immediate differences that I've spotted.

Q. But you don't -- you're not saying, are you, that PEG encompasses all the IVS standards?

A. No, I'm not saying that.

Q. Okay.

A. But I'm saying I haven't specifically been instructed to and I haven't looked at that question.

Q. Okay. You don't have any personal experience with Rio Tinto's application of the Controller's Manual guidelines, right?

A. Again, not personal experience of a particular guideline but, you know, my practice is -- well, in my practice I deal with the accounting manuals of companies on a,

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if not daily, weekly basis but Rio Tinto is just one of those.

Q. You've never worked in the accounting department of any company, have you?

A. No. But, you know, I'm in practice, which means my clients are pretty much all the accounting functions of companies, which is why I -- as I say, I routinely in my work look at the accounting manuals that companies have.

Q. Is it your view that the controllers group at Rio Tinto was required under the Controller's Manual to review all valuation calculated within Rio Tinto for any purpose?

A. Did you say all valuations or did you say all financial reporting valuations?

Q. All valuations.

A. I mean, I would have -- I'd have to look at what the Controller's Manual says but the Controller's Manual is in relation to the preparation of financial statements and accounts. Therefore, my expectation would be

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that there would be valuations that would be undertaken within Rio Tinto that wouldn't be reviewed under the Controller's Manual.

Q. So let me ask you it this way. Is it your view that the Controller Manual guidelines should apply to valuations that are not prepared for purposes of external financial reporting?

A. Can you just repeat that question again, please?

Q. Is it your view that the Controller's Manual guidelines should apply to valuations that are not prepared for purposes of external financial reporting?

A. Sorry. I don't quite -- I'm not sure I quite follow the question. The Controller's Manual, as far as I would understand it and expect, would apply to the financial reporting valuations that are undertaken by Rio Tinto.

There would be other valuations that are undertaken by Rio Tinto that I'm not sure would be caught by the Controller's Manual.

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But, as I said earlier, I would need to look.

Q. Okay. Let's move on.

Now, in your reports you discuss three main approaches to assessing the value of an asset. I believe it's the market approach, the cost approach, and the income approach. Is that right?

A. Yes, that's correct.

Q. Okay. Now, in assessing the value of an asset, a valuator has to choose which of these approaches to apply, right?

A. I mean, in order to do the valuation I agree that you have to choose one of those approaches.

But, again, looking at what I'm instructed to do here, which is to consider the outcome of an impairment test, Rio Tinto's accounting policies, as disclosed to the users of its financial statements actually already explained which approach it used.

Q. Okay. And the valuator has to use his or her judgment in determining which approach to apply in valuing a particular

asset, right?

And I'm talking in general, not specific here. I'm just -- in general.

A. Well, I think even in general terms you have to think about the specifics of what the valuation is for. So I don't think in general terms you can simply say it's all just down to the judgment -- down to judgment as to what approach should be applied. Yes, there clearly there is the judgment in that but depending on what the purposes of what the valuation is for there might be a particular approach that is required to be undertaken.

And, you know, the case that we're talking about here is a very clear example of that where according to Rio Tinto's accounting policies it explains that the income approach and specifically a DCF was the basis for doing an impairment. So --

Q. Okay. We'll get to that, Mr. Drewe. I'm just asking you a general question right now, okay?

So, generally, would you say that reasonable valuators can differ in determining

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which approach to apply in valuing a particular asset?

A. I wouldn't want to reach a general conclusion like that because I think it really does depend. I think it really does depend. If you're doing a valuation for corporate purposes, for example, and you've got an income-generating business and someone comes along and does a valuation by reference to the cost approach, I would say that that's not a reasonable basis potentially in that scenario.

Q. Are you saying that reasonable valuators can never differ in determining which approach to apply in valuing a particular asset?

A. No. I don't think that's what I just said. I said that I don't really want to provide a general opinion on what approach can be followed by someone doing a valuation. Because I think it's -- I don't think you can provide that general opinion.

Q. Okay. Can you answer this question. In deciding which valuation approach to apply, may valuators consider the

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purpose of a valuation?

A. Yeah. Absolutely.

MR. CONWAY: Object to form.

Q. And IFRS does not describe the use of a specific valuation technique; is that right?

A. IFRS -- I mean, and specifically IAS 36, no, it doesn't. But as I've already said, how a company would apply it is what is then reflected in their accounting policies in their financial statement.

Q. Okay. In the valuation of a mineral asset, are multiple valuation approaches typically applied?

MR. CONWAY: Objection, form.

A. I have seen a multiples approach applied in relation to -- in relation to an early stage asset, yes, I would agree with that.

Q. Sorry. That's not my question. I didn't mean a multiples approach. My question is in the valuation of a mineral asset, are multiple valuation approaches, meaning more than one valuation approach, typically

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applied?

MR. CONWAY: Objection, form. Vague.

A. I think with -- you know, taking away from financial reporting valuations to start with, often you would see more than one valuation approach. Either a main approach and the secondary approach being a sense check or the valuation actually being some sort of weighting between the two approaches or more than two approaches.

But in relation to -- in relation to a financial reporting valuation, specifically an impairment test under IAS 36, there is no requirement to undertake more than one valuation approach. And in the context of what I've done and what I've seen from Rio Tinto, and how it did its impairment test, its principal approach was the DCF. And I've not seen anything which would suggest that it would use more than one approach apart from essentially a sense check to its primary approach.

Q. So I know you just said in that

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answer that there's nothing within IFRS that requires more one valuation methodology.

My question is in valuing mineral assets under IFRS is more than one valuation approach typically applied?

A. Ignoring IFRS was the question, yes?

Q. No, I didn't say ignoring IFRS. I'm just saying in valuing mineral assets under IFRS, is more than one valuation approach typically applied?

MR. CONWAY: Objection, form.

A. I mean, let me put it this way. I think it's helpful to have a second approach. But whether or not that can be done is all dependent upon what is specifically known about whatever it is you're valuing.

Q. Okay. Okay. Now, in your rebuttal report at Section 2.4.1, you write this. You say, "Mr. Edwards states that textbooks and industry best practices calls for the use of at least two valuation methods. Mr. Edwards cites a number of textbooks in this regard, however, none of these textbooks

relate to financial reporting nor the requirement of IFRS."

And then you have a footnote to that paragraph where you say Edwards 1, paragraph 138.

So keep that part of your rebuttal report open and we're going to go look now at Mr. Edwards' report, which is Defendant's Exhibit 331.

Mr. Drewe, when you have Edwards' report please turn to page 56 of his report. Page 56, paragraph 138.

Are you there?

A. Yes, I am. Yes.

Q. Okay. It's on the screen as well. And you'll see that Mr. Edwards says in paragraph 138, "As stated earlier in this section, the textbooks and industry best practices for valuing mineral assets call for the use of at least two valuation methods," and then he has a footnote, footnote 283, and he cites a bunch of different sources.

Do you see footnote 283?

A. Yes, I do.

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Q. Okay. And you see among the items that he cites is the VALMIN code. Do you see that?

A. I do, yes.

Q. Is it your position that the VALMIN code does not relate to financial reporting valuation?

A. That's not my position, no. My position is that the requirements of IFRS, this way around, the requirements of IFRS do not require more than one valuation approach.

Q. Okay. Do you agree that the VALMIN does relate to financial reporting valuation?

A. I can't remember if it's that specific set of standards or another that one that refers to financial reporting valuation. But it has no standing within IFRS.

MR. CONWAY: Aric, we've been going for about an hour.

MR. WU: Yep.

MR. CONWAY: Pardon me. We've been going for about an hour. When it's convenient can we take a break?

C. DREWE

MR. WU: Sure. Sure.

BY MR. WU:

Q. Do you dispute that the VALMIN code calls for the use of at least two valuation methods?

A. You'd have to show me that particular part of it but I wouldn't be surprised if that's what it says.

Q. Right. But your position -- and this is probably my last question before we break -- is that the VALMIN code is not relevant to what you did here.

A. Yeah. The only thing that's relevant to what I did here is IFRS, the accounting policies, the Controller's Manual, and the other documents that I've referred to as to how Rio Tinto contemporaneously did its impairment test, which was not in accordance within the VALMIN code.

Q. Okay. Let's take a break.

MR. RICCIARDI: Move to strike the end of his answer as nonresponsive. Thank you.

THE VIDEOGRAPHER: The time is

4:12. This is the end of media labeled number two. We are going off the record.

(Recess taken.)

THE VIDEOGRAPHER: This is the start of media labeled number three. The time is 4:37. We are back on the record.

BY MR. WU:

Q. Mr. Drewe, your report says that a DCF --

MR. CONWAY: Aric --

MR. WU: Oh, sorry. Go ahead. Sorry. Go ahead.

MR. CONWAY: So during the break, there was conversation regarding the objection that the SEC made in connection with the work that Mr. Drewe did in his role as a consulting expert for the SEC. Upon consideration of points raised by Mr. Ricciardi during the break, the SEC will withdraw the objection to the extent that Mr. Wu wants to inquire as to the documents

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that he reviewed and the scope of his review pursuant to those instructions.

The SEC will maintain its objection based on work product to the extent that the questions seek the substance of the conversations that the SEC had with Mr. Drewe.

MR. RICCIARDI: Thank you, Dean.

MR. WU: Thank you.

BY MR. WU:

Q. Mr. Drewe, your report says that a DCF approach is typically used for mining companies; is that right?

A. Could you give me a specific paragraph?

Q. Sure. 13.6.17.

Do you see that?

A. Yes, I do. Yeah.

Q. Okay. What is the basis for your opinion that a DCF approach is typically used for a mining company?

A. I mean, that's based upon my -- based on my experience and -- I mean, I think what's important to recognize is that you're

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talking about mining companies, not an individual mining asset.

Q. So for -- would your opinion be different for an individual mining asset?

A. I think it very much depends on the specific -- on the specifics of that asset.

Q. Well, let me ask you this. When you state in your report that a DCF approach is typically used for mining companies, are you suggesting that that is what should have been used here in connection with the termination of the FVLCS of RTCM in half year 2012?

A. I am saying that in undertaking an impairment test, my approach is to seek to identify how Rio Tinto would have undertaken an impairment test as explained in the Controller's Manual, and as stated in it, the accounting policies to its financial statements. And both the Controller's Manual and the accounting policies in the financial statements refer to the fair value less cost to sell being determined by reference to a

DCF.

Q. Okay. Did you conduct any survey to determine whether the DCF approach is typically used for mining companies?

MR. CONWAY: Object to form. Vague.

A. I haven't done a survey to identify -- no.

Q. And are you aware of any such surveys?

A. Sat here today, I'm not sure either way. I don't know.

Q. Okay. Now, I want to talk now about what you call the market approach. I think sometimes in your report you also refer to the market approach as the multiple approach; is that right?

A. Yes.

Q. Okay. And is it your view that valuing mining companies under the market approach has inherent weaknesses?

A. It's my view that valuing -- valuing mining companies or, indeed, any company using a multiples approach, one has to

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be careful to identify relevant data to be used in the valuation.

Q. But in your view the market approach is typically not used for mining companies, right?

MR. CONWAY: Objection, form. Vague.

A. I don't think I described that -- I don't think I said it's typically not used. I think, as I've explained there, the DCF approach is typically used.

Q. So I'm asking you about the market approach. Is the market approach typically used for mining companies?

MR. CONWAY: Objection, vague.

A. I mean, it depends on the purposes of the valuation. But -- yeah, again, not just with mining companies, with all companies, quite often a market approach will be used.

As I'm explaining in this paragraph and as I've just said, when using the market approach, it's all dependent upon there being relevant data upon which to base

the valuation.

Q. Let me ask it this way. Would you agree that it is appropriate to use the market approach for mining companies at all stages of project development?

MR. CONWAY: Objection, form. Vague. Lacks foundation.

A. Well, again, it would depend upon the valuation. I mean, looking at the specific instructions that I've got in this case, which is not to consider just any valuation, but specifically consider the outcome of an impairment test, that impairment test in relation to the RTCM CGU as at the interim 2012, that would be required to be undertaken in accordance with Rio Tinto's stated accounting policies as disclosed in their financial statements as well as the Controller's Manual. And both of those refer to the use of the DCF approach rather than a multiples approach. Or a market approach.

Q. Let me just ask just for clarification. A few minutes ago you distinguished between mining companies and an

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individual mining asset. Do you consider RTCM to be an individual mining asset or a mining company?

A. Well, for the purposes of the impairment test you're looking at the RTCM CGU, which includes various mining-related assets.

Q. So you did not consider RTCM to be a mining company.

A. I mean, in the context of what IAS 36 says, I don't really understand that question. You're looking at the recoverable amount of the CGU.

Q. Well, I'm just using the language in your report so -- but we can move on.

So you say that -- in your report that there's nothing in the contemporaneous evidence suggesting that Rio Tinto would have undertaken impairment test by reference to more than one valuation methodology other than as a sense check to its principal DCF approach; is that right?

A. Could you just point me to the paragraph? I mean, I recognize --

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Q. Well, regardless of where it is in the report, is it your view that there was nothing in the contemporaneous evidence to suggest Rio Tinto would have undertaken an impairment test by reference to more than one valuation methodology other than as a sense check to the principal DCF approach?

A. Well, I'd like to look at the comment. You know, if you're asking me to confirm a quote in my report, then I would want to --

Q. I'm not asking you to confirm a quote in your report. I'm asking you whether in substance that's your view.

A. It's my view that based on the information I see, that I haven't seen evidence that Rio Tinto undertook impairment tests by reference to more than one approach apart from where a sense check was undertaken.

Q. Now, you rely on what's called in your report the half year 2012 impairment indicator review as an indication of --

(Telephone interruption.)

MR. WU: Would somebody mute that.

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MR. CONWAY: That was me. Sorry.

Q. You rely on what you call the half year 2012 impairment indicator review as an indication of how you believe Rio Tinto would have undertaken the impairment test at half year 2012, right?

A. No, I don't think I do do that.

Q. No? Let's look at your rebuttal report, 2.4.3.

And if you review 2.4.2 and 2.4.3 in conjunction, isn't it fair to say that you rely on the analysis in the half year 2012 impairment review as an indication of how you believe Rio Tinto would have undertaken an impairment test at half year 2012?

A. I don't think that's a fair characterization of what these two paragraphs are doing. What this -- what these paragraphs are doing are explaining the basis upon which I have considered the outcome of an impairment test. And, you know, in order to identify how Rio Tinto would have done an impairment test, I have considered -- and, again, I apologize for repeating it again -- what Rio Tinto said

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in its accounting policies, what it stated in the Controller's Manual, and various other documents that are set out at the start of Section 5 of my main report.

The half year 2012 impairment review, there wasn't an impairment test undertaken. So I don't think I am relying upon that half year 2012 impairment review as a basis for how they assess -- how they undertook an impairment test because they don't do an impairment test.

But this particular -- this particular sentence within 2.4.3 is explaining that a DCF model was used in the half year and referred to in the half year 2012 impairment review.

But I don't think that DCF model is an impairment test because they didn't do an impairment test.

Q. Was the DCF model used in the analysis in their half year 2012 impairment review, did that inform your view as to whether or not a DCF approach was appropriate for what you were doing here?

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A. I mean, it wasn't inconsistent with the approach, but my approach -- the principal reason why I concluded that a DCF approach is the appropriate approach because that's what's stated in Rio Tinto's accounting policies and that's what's stated in Rio Tinto's Controller's Manual.

The half year 2012 impairment review includes analysis based on a DCF model but that isn't an impairment test because Rio Tinto didn't undertake an impairment test.

Q. I just want to understand. The fact that the half year 2012 impairment review included a DCF model, did that impact your assessment here as to whether or not for your assignment the proper approach was to take an income approach? Or a DCF approach?

A. I mean, I repeat my previous answer. The reason I have concluded that the DCF approach is the right approach is not because of what's stated in the half year 2012 impairment review. It's because of what Rio Tinto states in its accounting policies, in its financial statements, issued to the users

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of those financial statements. And it's what's included in the Controller's Manual again with all the other evidence to which I refer in Section 5 of my report.

However, the half year 2012 impairment review does include a DCF -- the results of a DCF model, which is complimentary given that papers provided in context of consideration of impairment, it's confirmation that my approach is right.

But it's not the basis upon which I've reached my conclusion because, you know, there was no impairment test undertaken. This is the analysis in the half year 2012 impairment review was not an impairment test.

Q. Okay. So it's confirmation that your approach is right to use your words.

A. Yeah. I...

Q. But you would -- having reviewed the half year 2012 impairment review, you recall, don't you, that there was one -- more than one valuation methodology used?

A. Again, I mean, there's not an impairment test in there. But I recall an

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analysis based upon a DCF model and I recall an analysis of multiples, neither of which are impairment tests.

Q. So you do recall that there was a multiples analysis or a market approach analysis in the half year 2012 impairment review?

MR. CONWAY: Objection to form.

A. I did. I refer to that at paragraph 3.6.12 onward in my report. I have seen that comparables analysis.

Q. Okay. And you say -- you say that in 13.6.16, that it is likely -- or the transactions referred to by Rio Tinto in that multiples analysis were not appropriate comparators.

A. Yeah. I can see paragraph 3.6.16.

Q. Okay. And when you prepared your initial report, what materials did you review relating to the transactions, the comparators in the half year 2012 impairment review?

A. Well, I reviewed what Rio Tinto contemporaneously stated about these; that in the -- in the January -- January 2013

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impairment paper there is a -- there's an explanation from Rio Tinto. It might be helpful to go to that if that's one of my exhibits, but there was an analysis in there which says there are no appropriate comparators because of the infrastructure challenges so that -- that RTCM is facing. So that's Rio Tinto's words.

PwC considered that analysis and concluded that they agreed with the view that RTCM had reached that there were no appropriate comparators.

And then in the Project Mercury report, again, Rio Tinto's view was that -- and this is referred to at 13.6.18, resource multiples were not much help on this occasion given the nature of the asset.

So I relied upon Rio Tinto's analysis that result multiples are not much help.

Q. In all of the three materials that you just identified, the Project Mercury document, the PwC document, and then the January 2013 impairment, Rio Tinto document,

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they all postdated half year 2012, right?

A. The documents are dated but they're all looking back and considering what approaches could and should have been followed. And they are unanimous in their conclusion that a multiples approach was not the appropriate approach.

Q. In fact, all three of those documents are dated in some month in 2013, correct?

A. Again, I repeat, they're all looking back and they're unanimous in concluding that throughout the period it was not appropriate to -- you know, to use Rio's own word, results multiples were not much help on this occasion given the nature of the asset.

Q. And beyond those three documents that you just identified, did you conduct any other -- any independent analyses of the comparators cited in the half year 2012 impairment review?

A. I mean, I haven't checked whether these are the appropriate comparators. I

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haven't checked whether Rio Tinto has done the math right on these -- on these -- you know, to identify these multiples. I note that the -- you know, these multiples analysis that we're talking about in the half year impairment view -- I mean, putting aside that it looks like there's an issue between US dollars and Australia dollars, which is apparent on the face of it, but it's not sense checking the value of 30 June. It's sense checking the acquisition value, the PVA.

I don't think it's particularly helpful from our work anyway. We're finding the conclusions that Rio Tinto and PwC reached in relation to the usefulness of comparables and notwithstanding the fact Rio Tinto said in its accounting policies that an impairment test would be undertaken using a DCF approach.

Q. Let's talk about the DCF approach.

Would you agree that the conclusions from a DCF analysis are only as reliable as the underlying data and assumptions that are used in the model?

A. In general, I would agree that if

the assumptions are -- you know, garbage in, garbage out. If the assumptions are wholly unreliable, then the output of that DCF model will be unreliable.

Q. And would you agree that a DCF should only be used when the future cash flows of a project or an asset can be estimated with a sufficient level of certainty?

A. Okay. I don't know precisely what you mean by sufficient level of certainty. Sufficiency for who? With any DCF model that is being produced, there is uncertainty. You're looking at -- and you're trying to make forecasts and estimations about the future which -- you know, so there is always uncertainty. You never get -- or it's very rare that you get a DCF model that has uncertainty attached to it.

Q. So would it be okay to -- can you put any parameters on a level of certainty that needs to be reached understanding that all estimates -- all future cash flows are estimates, is there any level of degree of certainty that needs to be had in order for a

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DCF to be used?

A. I think again --

MR. CONWAY: Objection, form.

Vague.

A. I think it again comes back to what the purpose of the valuation is. You know, if it's a financial reporting valuation, then, you know, there might be different levels of certainty required compared with an M&A transaction, for example.

Q. Well, let's just take those two examples. As between a financial reporting valuation and an M&A transaction, which, in your mind, would require more certainty?

MR. CONWAY: Objection, form.

A. I mean, it really depends on the -- an M&A transaction, if you're departing with cash then it's really a matter -- a matter for the -- for whoever's dumping of that cash as to how much certainty they want in their estimates to go into forming the basis of a, you know, valuation of a company for M&A purposes. You know, and that's one of the reasons people do due diligence to kick

the tires on what the assumptions might be going forward. There will be different levels of due diligence. So I think there's no hard-and-fast rule in relation to M&A. I think it comes down to individual companies and it comes down to the sizes -- you know, the size of what's being purchased and, you know, the requirements of whoever's making the payments.

Under IAS 36, you know, there are clear requirements that are set out. And we can obviously look at some of those requirements. But if you look at paragraph 23, for example, of IAS 36, that explains that you can use computational shortcuts and you can use approximations in order to do what you can to come to either or a fair value less cost to sell or a value in use assessment.

Q. Let me ask you for -- because earlier you gave the example of financial reporting and M&A. For financial reporting, is it your view that -- well, can you compare as against M&A transactions? Is less certainty needed for financial reporting?

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MR. CONWAY: Objection, form.

A. Well, I think I've said that with M&A, there's a wide range. You know, so there is no hard-and-fast rule. It's down to the individuals who are making the acquisition as to how certain that they want to be.

Q. Okay.

A. But with financial reporting valuations, there are the requirements of IAS 36 as well as the rest of IFRS.

Q. And in your view, do IAS and IFRS require any level of certainty for future cash flows in order for a DCF to be used?

MR. CONWAY: Objection, form.

Vague.

A. I mean, there are requirements. As to -- there are requirements within IFRS. For example, it needs to be based on management's best estimate. It needs to be based upon supportable assumptions. It needs to consider potentially internal and external sources of information.

But IAS 36 provides the preparer the financial statements with help in getting

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to a fair value less cost to sell in the face of uncertainty.

Q. Let me ask you this. Is there -- in your mind is there a -- is there a sufficient level of uncertainty regarding future cash flows that kind of preclude the use of a DCF approach?

MR. CONWAY: Objection, form.

A. I don't think there's anything that precludes a DCF approach. And, again, important to look carefully at what IAS 36 does allow you to do. But if there is uncertainty, the first thing it allows you to do, paragraph 26, allows you to -- it allows you to use computational shortcuts and approximations.

If, for example, you are not in that scenario but instead you've got a number of different scenarios that you're considering at a point in time, what IAS 36 allows you to do, look at Appendix A, it allows you to do a scenario analysis between those different -- between those different options.

So applying that example to Rio

Tinto, for example, it would have been -- it would have potentially been permissible for Rio Tinto to have said, Okay, well, let's have a look at a valuation at the interim using a 25 million tons per annum, a 50 tons per annum, a 75 million tons per annum, and a hundred tons per annum coal chain solution. And the fair value less cost to sell, let's just weight across all of them or maybe we -- maybe, actually, the 50 million tons per annum is the most likely to begin to apply 50 percent weighting to that and then across the other ones. So that's the second thing IAS 36 allows you to do.

And then the third thing that it says is if you don't know what your fair value less cost to sell is, you've got no reasonable basis, I think is the phrase that it uses, then you do a value and use assessment instead.

And a value and use assessment in relation to RTCM, the RTCM CGU at the interim comes out at about 100 million.

Now, I don't think you're in a

scenario where, from what I've seen, that there was no reasonable basis upon which to get the fair value less cost to sell.

But if you are in that scenario, because there's so much uncertainty that I actually think you run a value and use assessment. And a value and use assessment in relation to these assets is going to include just the first phase. The Benga captures 2.6 million tons per annum.

Q. In your preparation of your report you identify 350 PTF models that provide an NPV for RTCM, right?

A. That sounds about the right number.

Q. Okay. And one of the model formats you discuss is what you call the Maglione format, right?

A. Yes. That's right.

Q. And you say in your report that Mr. Maglione was instructed to produce the new valuation model for RTCM assets in early 2012. Does that sound right?

A. That is consistent with my

understanding.

Q. Okay. And you ultimately say that the FVLCS RTCM should have been based on the Maglione format model, right?

A. I don't think I've concluded it should be based on that. What I've concluded is based upon the available models that I've considered, that's a reasonable basis to do. But it isn't a requirement that it be based on the Maglione model.

Q. Well, in your ultimate assessment of the FVLCS for RTCM you based it on a Maglione format model, right?

A. Yes. Yeah. I agree with that.

Q. Okay. And I think you said this before but just to confirm, you agree that DCF models can be prepared for different purposes?

A. Yes, I would agree that DCF models can be used for different purposes.

Q. Okay. And they can be used, for example, to determine formal valuation such as an FVLCS?

A. Yes. That was Rio Tinto's accounting policies.

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MR. CONWAY: Objection.

Q. Okay. Do you agree that DCF models can also be used for business planning purposes to assess different strategic options?

MR. CONWAY: Objection, form.

A. I agree that DCF models can be used for business planning.

Q. Okay. But you personally have never used a DCF model for business planning purposes, have you?

A. I mean, I think if you have -- for the work that I do, you know, that's not my area of expertise. We do have models that we use to run Mazars on.

Q. Well, would you agree that a model -- a DCF model used for business planning purposes may be different from a model used for formal valuations?

MR. CONWAY: Objection, form. Foundation.

A. I mean, it depends on the specific models you're talking about. But if you look at the Controller's Manual and what the

Controller's Manual says about an impairment test, the starting point is to state the business plans -- the business unit models that the business units within Rio Tinto were producing, so that is the starting point for the impairment test.

Q. So my question was not specific to Rio Tinto, okay? My question was would you agree that a model used for business planning purposes may be different from a model used for accounting purposes?

MR. CONWAY: Objection, form.

A. I mean, it's very vague. But, you know, business planning models could include, you know, a whole wide range of models. I would agree that within that whole universe of models some of them will be different to a model for accounting purposes, absolutely.

Q. Okay. And in analyzing any model, would you agree that it's appropriate to consider the context and the intended purpose of the model?

MR. CONWAY: Object to form.

A. I think I would agree that it's

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important to understand the purposes for which the model was produced or at least seek to try to understand that. Provided by -- I agree.

Q. Okay. And you reviewed the transcript of Mr. Maglione's deposition, right?

A. I haven't gone back and read it in detail for a while but I have read it.

Q. You have read it, okay.

And you understand that Mr. Maglione was not in Rio Tinto's controller's group?

A. That is my understanding.

Q. And would you agree from his testimony that Mr. Maglione developed what you're calling the Maglione format model for business planning purposes?

A. You'd have to take me to a specific part of his testimony that said that, but my general understanding is that is broadly what the model is for. But, you know, I'd want to see what the context for what he was saying.

Q. Well, let me ask it this way.

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Would you agree that Mr. Maglione did not develop the Maglione format model to be used as an impairment test?

MR. CONWAY: Objection to form.

A. Based on what the Controller's Manual says, that's not how Rio Tinto did its impairment test. It didn't create models specifically for the purpose of impairment tests. It took business unit valuations and business unit operating plans that were already in existence, for example the Maglione models, and used that as a starting point and made adjustments.

And that's exactly what Rio Tinto also said in its financial statements, that the impairment -- the DCF models upon which the impairment tests were undertaken were based upon the life of mine plans that had been produced.

So the impairment model wasn't specifically, you know, just produced for the purposes of an impairment model. Instead, the starting point is the internal business unit valuations that had been undertaken by the

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business unit and then certain adjustments were made to those models to ensure that they reflect the requirements of the Controller's Manual, the requirements of the accounting policies disclosed in Rio Tinto's interim accounts, and, you know, most importantly, reflected the requirements of IAS 36.

Q. So my question is a little bit narrower, okay? Just did you understand from Mr. Maglione's testimony that he developed his model to be used as an impairment test?

I'm not asking you about what the Controller's Manual says or PEG says. I'm asking you from his testimony, do you believe, and was it your understanding, that Mr. Maglione developed his model to be used as an impairment test?

MR. CONWAY: Objection. Asked and answered.

A. I mean, I would repeat -- I would repeat the answer I've just given because I think it's important context for what you're asking. An impairment test model, as far as I understand it, people at Rio Tinto weren't

instructed to just come up with impairment models from scratch.

Instead, impairment models were required to be based upon the business unit valuations and the annual operating plan of the business units and then adjustments were made in accordance with the accounting policies, the Controller's Manual, and IAS 36.

Q. Did you see any testimony from Mr. Maglione that he designed his model to be used for accounting purposes?

MR. CONWAY: Objection. Asked and answered.

A. I don't recall but, you know, I would repeat the answer to the previous question.

Q. Well, are you aware that Mr. Maglione testified that his model was never really finished?

A. Again, you would have to I think show me the specific paragraph where he talks about that. I don't know what he means by finished. I mean, Mr. Maglione's model was used as the basis for the January 2013

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impairment test. So at some point it was finished enough for that impairment test.

Q. Let me ask a very more specific question.

In selecting Mr. Maglione -- I'm going to use -- do you know what I mean if I refer to something called the Brisbane model?

A. Yes, I do.

Q. So in selecting Mr. Maglione's Brisbane model as a starting point for your assessment of RTCM's FVLCS at half year 2012 were you aware of Mr. Maglione's that his model was never really finished?

MR. CONWAY: Objection, form.

A. Well, I'd read his testimony before I produced my report. The Brisbane model described in the May 2012 presentation has the best configuration from the modeling to date.

Q. I just want to make sure I heard that right. You said the Brisbane described in the May 2012 has the best configuration from the modeling to date?

A. I think it's on the -- it might be

helpful to look at the presentation itself. That's what the presentation says from recollection.

Q. Okay. So I just want to make sure I understand what you answered. So your recollection or your understanding was that the Brisbane model was described in the May 2020 presentation as the best configuration of the modeling to date.

MR. CONWAY: Objection, form.

A. Yeah. If you look at paragraph 4.3.3 of my rebuttal report, I explain that the May 2012 Brisbane presentation explained that "RTCM has been evaluating multiple system configurations" and it described the May 2012 Brisbane models as "the best configuration from the limited modeling to date."

Q. So let me direct you to your rebuttal report. Page 26, 3.4.2c. Do you see where you say "Mr. Maglione and Mr. Moore, being those responsible for creating the Maglione model, appear to be satisfied with the model and consider it's at a stage where it could be used around March/April 2012"?

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A. Yes. I see that drafting.

Q. And Mr. Maglione's testimony that he felt his model could be used around March or April 2012, is that one reason why you say -- why you selected the Maglione format model to assess FVLCS at half year 2012?

A. It's certainly one of the reasons, yeah.

Q. Okay. And you're aware that Mr. Maglione testified that his model only became operational for the first time in March 2012, right?

A. Again, you would have to take me to the relevant part of the testimony. My recollection from his testimony is by June he testified -- and, again, this is just my recollection -- he testified that by June, so by the interim, the model was in a format that could run any scenario that Rio Tinto wanted.

Q. But if I understand what you've written in your report, one of the reasons -- and what you just testified a couple questions ago -- one of the reasons you felt you could use this model as a starting point was that it

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was at a stage where it could be used around March or April of 2012.

A. Well, yeah, the -- just to be entirely clear on this, it's in Section 13.3 of my main report where I explain the basis upon which I selected the May model.

In my rebuttal report, Section 3.4 is addressing and rebutting Mr. Edwards' suggestion that there was -- many critical inputs from the May model were missing. And this is one of the points that I have identified in response to what Mr. Edwards has said.

But the reasons why I've selected the May model are as explained in Section 13.3 of my main report.

Q. So I think we've used this phrase a couple of times today or you have, key models. You called several of Rio Tinto's models key models, right? You identify eleven of them.

A. Yes. That's right. I explain the basis for that in Section 6 of my report.

Q. Okay. And you personally have

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reviewed all eleven of these key models?

A. Yes, I have.

Q. Okay. And did you review other DCF models for RTCM outside of the key models?

A. Yes, I have seen -- I mean, I personally haven't looked at all 350 of the DCF models, but I've looked at more than the key models and all of those 350 have been reviewed by my team under my direction.

Q. Okay. And in your review of the 15,000 and plus documents that we've talked about today, did you see any Rio Tinto document referring to these eleven models as key models?

A. The term "key model" is my term simply used to identify the fact that these are the models that I have analyzed in my report and that are focused on in my report.

Q. And you assume that there's some robustness to these key models because you identified presentations that contain their output; is that right?

MR. CONWAY: Objection, form.

A. Yeah. I identify them as key

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models because I've been able to reconcile their output to a presentation or to a report and, therefore, you know, I've got some certainty on what the date of the model is at a critical starting point.

Q. In your review of the 15,000-plus documents, there were other reports or presentations containing valuations for RTCM that are not just MPVs coming out of these eleven key models, right?

MR. CONWAY: Objection, form. Lacks foundation.

A. I mean, a good example of that is the 5.1 billion valuation referred to in the half year 2012 impairment paper. I did request from -- via the SEC that particular model and the documents that I was referred to by Rio Tinto weren't to that model so that's the model, for example, that 5.1 billion that I don't have.

Q. I guess what I'm getting at is you didn't identify as a key model each model that appeared to tie to a presentation or report in the 15,000 plus documents.

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MR. CONWAY: Object to the form.

A. Well, we're talking here about -- instead of the 15,000, we're talking about 350. Those 350 models, the first question, having gone through them, is can I identify what the purpose for the models was and how can I -- or what can I agree them into in terms of presentations or reports.

There are models included within that 350 that I haven't referred to as a key model that I have seen in another -- in a document. And a good example of that is -- are the two models that I analyzed in my rebuttal report which were -- I'll give you a particular reference.

In Section 4.4 of my rebuttal report the committed capsule scenario and the probable capsule scenario. So those were models that I had identified that I didn't include as key models in my main report. They weren't valuing the whole of the RTCM CGU. They were just -- the first one was looking at just the committed Benga stage 1 and the probable looked at Benga stage 1 and 2 and a

higher steady state production.

Q. Outside of the eleven key models, would you agree that there are at least some of the 350 DCF models that do value the whole of the RTCM CGU?

MR. CONWAY: Object to form.

A. Yeah, I -- there are models outside of eleven that value all of the RTCM CGU. I agree with that. Many of them are. But it doesn't mean -- I understand what the purpose --

Q. And that the output from those models are included in reports and presentations.

MR. CONWAY: Objection, form. Foundation.

A. Well, you'd have to show me specifically which models and which presentations.

Q. Let me just ask you this. For your definition of key models, have you -- are you claiming that the eleven models that you've identified as the models, are the only models whose output appear in reports and

presentations?

MR. CONWAY: Objection, form.

A. I don't think I've ever claimed that. I think that's mischaracterizing what I'm saying. These were the most -- these eleven models were models that I have been able to agree in presentations and reports in that 15,000 documents.

As to whether one of the other models in the 350 might agree into another document within the 15,000, I don't know.

Q. Okay. Now, you say there are three key models that could have been used as a starting point in assessing RTCM's FVLCS in half year 2012, right?

A. Well, the words that I actually say are that there are number of DCF models that could be used as a starting and in particular these models include, and then there are certain of my key models.

But I'm not suggesting that it necessarily had to be a key model that was the starting point for assessing the fair value less cost to sell.

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Q. Well, let me direct you to your rebuttal report, page 28, 4.2.2(a).

A. Could you give me that reference again, please.

Q. Page 28, paragraph 4.2.2 subparagraph (a). First sentence. And I'll just read it for the record. "There are only three key models that could have been used as a starting point for assessing the FVLCS of the RTCM CGU as at 30 June 2012."

Did I read that correctly?

A. Well, you read that sentence correctly but this is responding -- this is responding to Mr. Edwards' suggestion that -- and it's him that's narrowed it down to the -- I believe, that's narrowed it down to the eleven key models as shown in the quote at 421. He's suggesting I've picked the most pessimistic of all the key models. And in response to that I've explained that they're not of all of the key models, so it's him that's narrowed it, there are only three that could have been used as a starting point. So, again, I don't agree with that

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characterization.

And you need to look at 13.3.2 of my main report, which explains that when considering the Plan NPV for use as a starting point for assessing the fair value cost to sell, there are a number of DCF models that could have been used as a starting point. In particular these models include, and then I list three of the key models.

Q. And those three key models -- let me just make sure I understand those three key models. Are they the May 2012 Brisbane model, the June five-year plan model, and the July reference based model?

A. Yes. That's correct. Those are the three models that I identified.

Q. Okay. And those were all prepared before Rio Tinto released its half year 2012 financial results on August 8th, 2012?

A. I understand that to be the case, yes.

Q. Okay. And you ultimately -- out of those three, you ultimately selected the May 2012 Brisbane model as your starting

point, right?

A. In my main report I did, yeah.

Q. Okay. And the Brisbane meeting -- you understand what I'm referring to when I say the Brisbane meeting?

A. I do, yeah.

Q. Okay. The Brisbane meeting took place about seven weeks before the end of half year 2012?

A. That's broadly consistent with what my recollection is. I think that's about right.

Q. Okay. And about three months before Rio Tinto published its half year 2012 results on August 8, 2012? Roughly.

A. Yes. Give or take, yeah.

Q. Okay. And of your eleven key models, was the Brisbane model the most recent DCF analysis as of August 8th, 2012?

MR. CONWAY: Objection, form.

A. The -- well, firstly, I think the relevant date is the 30th of June 2012, not the date that the financial statement were issued. That's the date at which I'm doing

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the impairment test.

The main model was not the latest of those three models, I agree. But the reasons why I selected the May model over the other two models are explained in paragraph 13.3.2 of my main report.

And in my rebuttal report, in response to Mr. Edwards' consideration, I considered my opinion -- my conclusion if either the June 2012 five-year plan model or the July reference case model, and, indeed, two of the models had any of those, now in total, five models being used as the starting point. And my conclusion remains as I concluded in my first report.

Q. Mr. Drewe, I'm going to really try to ask you to just answer the question that I ask. I know you have a lot that you want to say but the day will move along if you actually just answer the question that I ask, okay?

On your models --

MR. CONWAY: And for the record -- wait, wait. Hold on a second. For the

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record, I will object to the extent that his questions -- he needs to answer his questions fully and you make an effort to stop his answer.

MR. WU: I didn't make an effort to stop his answer. I waited until he was done, Dean.

MR. CONWAY: I'm not -- I'm just saying in general based on the last point you just expressed. I know some of the answers are long but they're not --

MR. WU: Okay. Dean. I get it.

BY MR. WU:

Q. Would you agree with me that of your eleven key models, the Brisbane model has the very lowest NPV?

A. I agree it had the lowest computed output, yes.

Q. Okay. And I take it because you didn't select the June five-year plan model as your starting point, that you didn't believe that it was important to select the DCF model that was closest in time to half year 2012 as

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your starting point.

MR. CONWAY: Objection, form.

A. Well, as I explain in 13.3.2(b) the reason I didn't select the June 2012 five-year plan model is because Mr. Morris prior to his -- excuse me -- the aspirational view. And an aspirational view is inconsistent with the requirements of a fair value less cost to sell.

And notwithstanding that, you know, again, I refer in my rebuttal report and have now considered the June 2012 five-year plan model and my conclusion remains the same.

Q. So I'm focused now on your original selection of the May 2012 Brisbane model, okay? Do you understand that?

A. I do, yes.

Q. Okay. So what criteria did you apply for selecting the May 2012 Brisbane model as your starting point? Just list the criteria for me.

A. My logic flow is -- well, let's first identify what models to -- which of the models that I've analyzed in detail could I

use as a starting point. And I've identified three models there very clearly at 13.3.2. May, June and July.

The July model I dismissed because the July model included upside prices and that is inconsistent with what -- as to how an impairment test in relation to the RTCM assets should have been undertaken. And as soon as you adjust those pay prices, the computed value is actually significantly worse than the May model. So the July model I've therefore, for purposes of my first report, my main report, I've dismissed.

So you're therefore left between the May and the June model. The June model was contemporaneously described as being the aspirational view by Mr. Morris and, as I've explained, that is inconsistent with the requirements of the fair value less cost to sell.

The May model was contemporaneously described as being the best configuration from the limited modeling today, which gives me some comfort in its

assumptions.

And, you know, thinking between what is -- actually what is driving the difference between the May model and the June model. You know, they're not actually that significantly different. There's a difference in -- from recollection, there's a difference in the operational expenditure for Zambeze in the June model and there's a slight difference in one of the production profiles.

We're not talking about two very different models here. A lot of the assumptions are very consistent between the two models. But on the basis that the May model was described as being the best configuration to date and that the June was the aspirational view, I started with the May model.

Q. I want you to look at Section 6.4.10 of your initial report. This is -- you'll see in Section 6.4.10 you're talking about the June 2012 five-year plan, right?

A. Yes, I am.

Q. And you say it includes -- the

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last sentence says it includes a central case estimate NPV RT share of US 1.1 billion?

A. Yes, I see that.

Q. Okay. Let's look at Defendant's Exhibit 416.

And you'll see that there's a cover e-mail but with an attachment printed out. Is the attachment the June 2012 five-year plan that you referred to in your report?

A. Yes. I think it is.

Q. Okay. So, Mr. Drewe, there's a black-and-white copy that's harder to read but if you flip to the back there's a color copy. That might be easier to look at, okay?

A. Okay.

Q. And if you could turn to what's slide 14 in the deck, the color copy deck.

A. Okay.

Q. And now you see the table on slide 14?

A. Yes, I do.

Q. Okay. Now, the 1.1 billion NPV that you described in Section 6.4.10 of your

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report is in the bottom center of this chart, right?

A. Yes, that's correct.

Q. And this is -- using the heading on this chart that's the Central Possible Case, right?

A. Yes. That's correct.

Q. So the 1.1 billion NPV is not the central case, right?

A. Say that again, sorry.

Q. The 1.1 billion NPV on this chart is the central possible case, it's not the central case estimate, right?

MR. CONWAY: Objection.

A. It's not the central probable, if that's what your question is.

Q. Right. Right. So the central probable case here is 75 million, correct?

A. Yes. That's correct.

Q. Is there a reason why you chose to say in your report that the central case estimate out of the June five-year plan was 1.1 billion rather than the 75 million represented in the center of the chart?

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A. Well, it is the central economic scenario, the 1.1 billion. So it's -- I mean, literally the heading of that column is Central.

Now, as to what the actual scenario is between committed, probable and possible, looking at what is in 6.4.10 and specifically footnote 208, I explained -- I mean, it's clear from that I'm picking a central possible case.

Q. Is there any reason why you didn't choose the central probable case when characterizing the June five-year plan?

A. I mean, there's no specific reason why that couldn't be changed. I mean, clearly that's got a significantly lower value. I mean, both of them are significantly less than the carrying value, in any event.

But, I mean, I agree that could be another starting point and, indeed, that's the value I look at in my rebuttal report.

Q. But you can't explain why your report in 6.4.10 used the June five-year plan that the central case estimate was 1.1 billion

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rather than 75 million.

MR. CONWAY: Objection.

A. It is in the column with the heading Central. So it is --

Q. Okay. Let's move on.

A. It's the economic --

MR. CONWAY: Wait, wait, wait. He's not finished.

A. The economic scenario is the central case. I make clear in footnote 208 that what I've identified is the central possible case.

I agree that the probable case is another model that can be considered and, indeed, I have done by way of -- you know, in my rebuttal report. But I'm not sure it really adds much to the question of whether there would have been a material impairment because my conclusion remains as I've stated in my first report.

Q. Okay. Let's move on to a different subject.

One of your reasons for choosing the Brisbane model as your starting point was

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that the slide views at the meeting had been developed over a number of months; is that right?

A. Yes. I say that at 13.3.3.

Q. Okay. Over how many months were these slides developed?

A. I don't recall. I would need to look.

Q. So you're not aware that a very early draft of the slide presentation was not prepared until early May 2012?

MR. CONWAY: Objection. Mischaracterizes his testimony.

A. Yeah, as I said, I don't specifically recall.

Q. Let me ask you this. If, as I'm representing to you, a very early draft of the slide presentation was not prepared until early May 2012, would you still have elected the Brisbane model as your starting point?

A. Yes.

Q. But then one of the reasons you would have selected the Brisbane model would not be the slides had been developed over a

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number of months, right?

A. I agree. It's probably one of the least important factors that I list at 13.3.3. If what you're saying is they haven't been developed over a number of months, I would agree that sentence would need adjusting. But I would still conclude that the May model's an appropriate starting point.

Q. Another reason you chose the Brisbane model as your starting point was that the outputs from the model were included in presentations provided to Mr. Albanese and Mr. Elliott, right?

A. Yes.

Q. And the fact that the outputs of the model were shown to Mr. Albanese and Mr. Elliott led you to conclude that there was some robustness to the Brisbane model to the NPV, right?

MR. CONWAY: Objection to form.

A. I do refer to the output at 13.3.3, I agree.

Q. And you reviewed the document you called the final May 2012 Brisbane

presentation, right?

A. I believe I reviewed the final, yes.

Q. Okay. And that's the presentation that you understand was provided to Mr. Albanese and Mr. Elliott?

MR. CONWAY: Objection, foundation.

A. Sorry. Could you repeat that question?

Q. I'm asking you whether the final May 2012 Brisbane presentation is the presentation that you understood was provided to Mr. Albanese and Mr. Elliott.

MR. CONWAY: Objection, foundation.

A. That is my understanding.

Q. Okay. And -- but you understood, as well, though, that the final May 2012 Brisbane presentation did not provide any NPV from the Brisbane model, right?

MR. CONWAY: Objection, to form.

A. My recollection -- and it maybe would have been helpful to look at it, but my

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recollection is that document is that it didn't include the stated NPV.

Q. Did not, right?

A. The face of the document didn't. I understand that there may be some dispute as to whether it was referred to orally in the meeting, but the presentation itself didn't include the stated NPV. It did include other outputs from the May model.

Q. Your view is that the NPV is the most important output of a DCF model, right?

MR. CONWAY: Objection, form.

A. I'm not sure how I would define "most important." Clearly it is an important output.

Q. An output that was not included in what you called the final May 2012 Brisbane presentation provided to Mr. Albanese and Mr. Elliott.

A. As I said, my recollection of that document is that it didn't -- the final version didn't include that figure. It included a number of the other outputs. And I believe that there is some dispute as to

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whether it was said orally. But this is the presentation. It's not on there.

Q. You understand that Eric Finlayson was the managing director of the RTCM at the time of the Brisbane meeting?

A. Yes, I do.

Q. Okay. And was it your understanding that Mr. Finlayson presented what you called the final May 2012 Brisbane presentation to Mr. Albanese and Mr. Elliott?

MR. CONWAY: Object to the form.

A. I don't specifically recall either way, to be honest. My recollection is he was certainly there. I can't remember who presented.

Q. Okay. Based on your appendix -- the appendices to your reports, it appears that you reviewed Mr. Finlayson's deposition testimony, right?

A. Yes, I did. Before I did my report, yes.

Q. Okay. So the question is in selecting the Brisbane model as the starting point for establishing the FVLCS of RTCM at

half year 2012, you were aware that Mr. Finlayson believed the model should not be relied upon, right?

MR. CONWAY: Objection, form.

A. Could you show me the specific paragraph so I can see the context of what he has said.

Q. Well, let me just ask you. Before we show any testimony, were you aware of Mr. Finlayson's testimony that he believed the model should not be relied upon?

MR. CONWAY: Objection, form.

A. I've read the testimony but I'd want to refresh my memory before, you know, answering that question.

Q. Well, let me ask you a different question. Were you aware that Mr. Finlayson testified that he explained at the Brisbane meeting that RTCM's financial modeling at the time was indicative only?

MR. CONWAY: Objection, form.

A. I'd repeat my previous answer, which is you would need to -- I'd love to look at that in the context of what he was being

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asked and what he said.

Q. Okay. Mr. Finlayson -- then let me ask, do you recall that Mr. Finlayson further testified that he used the term "indicative" in saying that RTCM's financial modeling should not be relied upon?

MR. CONWAY: Objection, form.

A. Again, I don't recall the specifics on that either way.

Q. Let me just ask it this way. If you were aware that Mr. Finlayson, who was the head of RTCM at the time, testified that RTCM's financial modeling at the time of the Brisbane meeting should not be relied upon, would you have selected a different model as the starting point for your assessment of RTCM's FVLCS at half year 2012?

MR. CONWAY: Objection, form.

He's asked to see the passages from Mr. Finlayson's transcript that you're referring to. And I'd ask that you show them to him so he can refresh his recollection as to what that testimony way.

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MR. WU: Dean, I've asked him a hypothetical question. You're free on your direct to do whatever -- on your redirect to do whatever you want. But I'm asking him a hypothetical question and I would ask for an answer unless you're instructing him not to answer.

MR. CONWAY: Okay. So this last question is based on facts that you're asking him to assume as opposed to things that Mr. Finlayson actually --

MR. WU: That's why I used the word --

MR. CONWAY: I'm not done. I'm not done. Hold on.

-- actually testified to in his transcript that you've been asking him about.

MR. WU: I'm asking -- and I'll just repeat the question, okay?

BY MR. WU:

Q. If you were aware, Mr. Drewe, of Mr. Finlayson's testimony that RTCM's financial modeling at the time of the Brisbane

meeting should not be relied upon, would you have selected a different model as your starting point for the assessment of RTCM's FVLCS at half year 2012?

MR. CONWAY: Okay. I'm going to renew my objection. I don't know what you mean by "if you were aware." Mr. Finlayson testified on this topic. Now, if you're asking him to assume the facts as you've characterized there for the purposes of this question, then, that's fine. But to the extent you're representing --

MR. WU: Yes.

MR. CONWAY: -- that that's what he's testified to, then state that.

BY MR. WU:

Q. Okay. Assume that Mr. Finlayson testified that RTCM's financial modeling at the time of the Brisbane meeting should not be relied upon. If you knew that, would you have selected a different model as the starting point for your assessment of RTCM's FVLCS at half year 2012?

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MR. CONWAY: Objection, form.

A. Well, I mean, it very much depends on the reason as to why it can't be relied upon. For example, if the reason hypothetically he's saying the model should not be relied upon is because there are computational shortcuts, then that would be completely fine in accordance with IAS 36. So I would still be picking that May model, which is why the context of what he's saying or what's he testified to is quite important.

Q. And what if he had testified that the reason the numbers could not be relied upon -- that the model could not be relied upon is because RTCM was unsure of a lot of the inputs into the financial modeling at that time?

MR. CONWAY: I'm going to again object to the extent this question is asking about testimony that we have as part of the record. If you're asking him to make assumptions based on your hypotheticals or representations, then make that clear, but he's asked to see

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the transcript. If you've got a specific question regarding something that Mr. Finlayson testified to, then show it to him.

BY MR. WU:

Q. Okay. You can assume that I'm making a representation and now you can answer.

A. Sorry. Can you recent it?

MR. CONWAY: Objection to form.

Q. Would it matter to you in the selection of a starting point if Mr. Finlayson had testified that the reason the financial model -- RTCM's financial model should not be relied upon was because RTCM was unsure at the time of a lot of the inputs of their model?

MR. CONWAY: Objection, form.

A. I think, again, it very much -- it very much depends on the specifics. If hypothetically Mr. Finlayson has said that RTCM and Rio Tinto were still working on the inputs, then the relevant question from an IAS 36 perspective and from an impairment test perspective is whether or not those inputs --

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whether or not they're being worked on aside -- whether those inputs reflected the best estimate at that point in time.

And if they reflected the best estimates at that point in time, knowing that those estimates might continue to change and develop, then that is still a reasonable starting point for undertaking a fair value less cost to sell assessment, which is based upon management's best estimate at that point in time.

Q. And let me ask you that. Would you expect management's best estimates to have improved over time, meaning would their best estimates have changed between May of 2012 through June 30, 2012?

MR. CONWAY: Objection, form. Lacks foundation.

A. I really don't know. I mean, as you refine your estimates, the number -- the value number could go up or down.

MR. CONWAY: Aric, pardon the interruption. We've been going for about an hour or so. When it's

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convenient can we take a break?

MR. WU: Okay. I'll be done with this section begin five minutes.

BY MR. WU:

Q. Did you review the deposition testimony of Simon Morris?

A. I did, yes.

Q. Okay. And you're aware that Mr. Morris prepared the draft presentation for the Brisbane meeting which contained the negative NPV referenced in your report?

A. I don't specifically recall that.

Q. And by negative NPV, you know I'm referring to the negative 600 -- approximately negative 680 million NPV?

A. Yes. I understand that.

Q. And do you recall that Mr. Morris testified that at the time he prepared materials for the Brisbane meeting, RTCM had not decided to move forward with the scenario that resulted in the negative 680 million NPV?

A. Again, I don't recall the specifics of what Mr. Morris said.

Q. Okay. Are you aware that Mr.

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Morris testified that he did not believe RTC was worth negative 680 million at the time he prepared the Brisbane meeting materials?

A. Again, I would have to look at the report. I don't specifically recall that now.

Q. And if you were aware of that testimony -- well, let me say it this way. If you had been aware of that testimony at some point, it didn't impact your selection of the May 2012 Brisbane model as your starting point, right?

MR. CONWAY: Objection, form.

He's testified he didn't recall that testimony from Mr. Morris. Is this a hypothetical or are you making representation as to how Mr. Morris testified? Or could you at lease show him the transcript so he can refresh his recollection?

BY MR. WU:

Q. I'll represent that he testified that he did not believe that RTCM was worth negative 680 million at the time he prepared the Brisbane meeting materials.

Does that impact your view as to whether or not the May 2012 Brisbane model is the appropriate starting point for your assignment here?

A. I don't think it would change my conclusion, no.

MR. WU: Okay. Let's go off the record.

THE VIDEOGRAPHER: The time is 6:07. This is the end of media labeled number three. We're going off the record.

(Discussion held off the record.)

(Luncheon recess taken at 6:07 p.m.)

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A F T E R N O O N S E S S I O N

(Time noted: 6:50 p.m.)

THE VIDEOGRAPHER: This is the start of media labeled number three. The time is 6:50. We are back on the record.

* * *

C H R I S T O P H E R D R E W, resumed and testified as follows:

EXAMINATION BY (Cont'd.)

BY MR. WU:

Q. Mr. Drewe, there were assumptions in the May 2012 Brisbane model related to a Greenfield Railway, right?

A. That is correct, yeah.

Q. And that Greenfield Railway was forecast to require significant capital costs, right?

A. Yes. That is correct.

Q. And across the -- your eleven key models, the cost of the Greenfield Railway was forecast to range from roughly 7.2 billion to 8.1 billion, right?

A. That sounds about right. I mean,

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I haven't checked it exactly but, yes, it's in that order.

Q. Okay. And am I right that you concluded that the range of capital cost for Greenfield Rail that appeared in the key models was reasonable?

If it helps, I can direct you to page 180 of your opening report.

A. Yes, I do. I mean, the section of the report where I specifically considered this is 11.4. And specifically at paragraphs 11.4.6 onwards within that section.

Q. And just to confirm, you concluded that the capital costs in the Greenfield Railway when they were included in the key models appeared reasonable.

MR. CONWAY: Objection, form.

A. My conclusion was that they were consistent -- fully consistent with the estimates set out in Table 11A and Table 11A has been derived from a document dated March 2012 which sets out the cost of the Greenfield Railway.

Q. Do you know whether, as of June

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30, 2012, Rio Tinto was planning to spend more than $7 billion on a Greenfield Railway?

A. I mean, it depends on exactly what you mean by whether Rio Tinto was planning on doing it. That capital cost remained in the key models right up until the November 2012 impairment model. So from the perspective of the models, that's what they were forecasting.

Q. Did you review the deposition of Doug Ritchie, the head of Rio Tinto Energy?

A. I did prior to issuing my report, yes.

Q. And were you aware that Mr. Ritchie testified that the capital spending that Mr. Finlayson proposed at the Brisbane meeting was rejected by Mr. Albanese?

MR. CONWAY: Objection. I'd like to have the witness have the opportunity if he wishes to see the portion of the transcript you're reading from so that he can read it within the context of what you've stated.

MR. WU: Dean, I'm going to conduct my examination the way I want to

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conduct it.

Q. So I'm going asking you, were you aware that Mr. Ritchie testified that the capital spending that Mr. Finlayson proposed at the Brisbane meeting was rejected by Mr. Albanese?

MR. CONWAY: And I'm going to object to the extent -- is this a hypothetical or are you representing that that's an accurate representation of the transcript?

MR. WU: Neither. I'm asking if he was aware. It's not a hypothetical.

MR. CONWAY: Aware of --

Q. Are you actually aware that Mr. Ritchie testified that the capital spending that Mr. Finlayson proposed at the Brisbane meeting was rejected by Mr. Albanese?

MR. CONWAY: Same objection. I don't know if you're testifying or you're representing that's what he testified or you're asking him to assume a fact or exactly what you're doing.

MR. WU: Are you instructing him

not to answer?

MR. CONWAY: No. He can answer.

MR. FLETCHER: I'm going to object to this coaching. Please let him ask -- answer.

MR. CONWAY: I'm not coaching. I'm just trying to figure out if this is a hypothetical or if this is a representation of --

MR. WU: I just told you it is not a hypothetical. Dean, I just said it's not a hypothetical. I said are you actually, not hypothetically, actually aware that Mr. Ritchie testified that the capital spending that Mr. Finlayson proposed at the Brisbane meeting was rejected by Mr. Albanese.

MR. CONWAY: Objection. Assumes facts not in evidence.

BY MR. WU:

Q. Please answer.

A. As I stated in my previous answer, I have read that deposition prior to issuing my report. I don't specifically recall sat

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here today what it was that he testified to so I would need to see it in its context.

Q. Okay. Now, you say in your report that to calculate the FVLCS for RTCM for half year 2012 Rio Tinto would have used the Plan NPV, right?

A. Could you give me a specific paragraph that you're referring to?

Q. Well, let me ask you this. Do you know what the Plan NPV is in the context of this case?

A. Yes.

Q. And I'm just asking you substantively, is it your view that to calculate the FVLCS for RTCM in half year 2012 that Rio Tinto would have used as its starting point the Plan NPV?

A. That is what the Rio Tinto's Controller's Manual say.

Q. Let me ask you this. Do you believe that the June 2012 five-year Plan NPV represented a Plan NPV?

A. But, I mean, I think it would be helpful to look at specifically what the

Controller's Manual says on this point. I think the words that it uses from recollection are that it's normally the starting point is the Plan NPV. As to whether at the interims a Plan NPV has been signed off -- was that your question?

Q. No. I just asked you whether or not you believed the June 2012 key model, the NPV in the June 2012 key model represented a Plan NPV.

MR. CONWAY: Object to form.

A. I don't know whether it was a signed off Plan NPV but for purposes of an impairment test, that's not -- that's not the relevant question.

Q. Okay. So regardless of whether or not it's relevant, do you believe that the June 2012 -- the June 2012 key model that you identified, that the NPV reflected in that model reflected a Plan NPV?

MR. CONWAY: Objection, form.

A. I mean, I think it goes to exactly what is being defined as a Plan NPV, which I think is why it might be helpful to look at

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the Controller's Manual, which I think is where this is coming from. The Controller's Manual referred to this unit valuation and the valuations were -- and business plans were produced in the course -- you know, by the business units. I can't recall the specific words without looking at the Controller's Manual.

Q. Sitting here today, you can't say whether or not the June 2012 model, the NPV in that June 2012 model represented a Plan NPV under the Controller's Manual.

MR. CONWAY: Objection, asked and answered.

A. I'm asking to have a look at the Controller's Manual so we can see how the Controller's Manual describes the Plan NPV. And then we can compare the June plan with that.

Q. Let me ask you, out of your eleven key models, did you identify any of them as being a Plan NPV under the definition provided in the Controller's Manual?

A. Again, I think it would be helpful

to take a look what that definition in the Controller's Manual of what Plan NPV is. But, you know, it includes the January 2013 impairments, which really contain -- ultimately recognize.

Q. Out of your eleven key models, the only one that you can identify as a Plan NPV is the January 2013 impairment model?

MR. CONWAY: Objection to form.

A. That's not what I just explained.

Q. Can you identify any one of the eleven key models as a Plan NPV?

MR. CONWAY: Objection.

A. Again, it comes down to what is meant by what you're referring to as Plan NPV there, which I think you're referring to what's in the Controller's Manual and without looking at how the Controller's Manual describes those plan NPVs or describes NPVs, it's -- you know, I can't give any more of an answer.

Q. And you used the phrase Plan NPV in your reports, right?

A. I do, yes. I refer to at 5.4.

C. DREWE

Q. And do you mean by Plan NPV when you referred to them in your report?

A. At paragraph 5.4.2 I'm saying it's clear from the available information that what is described by Rio Tinto as the Plan NPV is the starting point for this investment, this assessment being the impairment test.

Controller's Manual further explains that the Plan NPV, the valuation, included in the annual plan submissions.

Q. So let me ask you again. Out of your eleven key models, did you identify any of them as being a Plan NPV as you understood what the term Plan NPV meant when you used them in your report?

A. Looking at footnote 130 of 5.4.2 there is also the explanation in Rio Tinto's annual financial statements and in the accounting policies there as to what -- as to, in effect, what the starting points for the impairment test should be.

As to whether, you know, if Plan NPV simply means the annual plan submissions, then I'm not aware of whether any of the --

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whether any of the -- you know, within the material period, whether any plans were formally submitted.

But for the purposes of an impairment test, that's not the relevant test.

Q. Okay. One of your other key model is the July 2012 reference case model, right?

A. Yes. That's correct.

Q. And this model relates to a scenario described in RTCM's conceptual growth program?

A. Yes. That is correct.

(Defendant's Exhibit 45, e-mail dated 24/07/2016 with attachment, previously marked for identification.)

BY MR. WU:

Q. Let's look at Defendant's Exhibit 45. Do you have that in front of you, sir?

A. No. Can you put it up on the screen so I can see what the number was. Did you say 425?

Q. Forty-five.

A. Oh, 45. Sorry.

Okay. I have it.

C. DREWE

Q. Okay. And the attachment -- is the attachment the conceptual growth program that you referred to in your report?

A. Yes. I believe it is.

Q. And does it appear that the conceptual growth program, the document's over a hundred pages?

A. Yes, it is.

Q. And do you have -- is it your understanding that the conceptual growth program took a significant amount of time to put together?

MR. CONWAY: Objection, form.

A. I'm not sure -- I'm not sure I've read anything either way on that. I mean, I wouldn't be surprised given it's a hundred pages but I don't know how it was put together.

Q. And I'm asking you a question that is -- I'm not asking you a hypothetical, okay? Are you aware that Simon Morris testified that the conceptual growth program was just a concept?

MR. CONWAY: Objection. Assumes

C. DREWE

facts not in evidence.

A. I would need to see -- I don't recall specifically what Simon Morris said in relation to the conceptual growth program. I would need to look at what he said in his deposition.

Q. Well, separate and apart from whatever Simon Morris testified, based on your review of the conceptual growth program, would you agree that it was a concept only?

MR. CONWAY: Objection to form.

A. Sorry. With apologies, the line for me is not particularly good at the moment. You're breaking up with your questions. I could hear you much better in our previous session.

Q. Okay. Can you hear me now? Is that better?

A. Yeah, I can hear you now.

Q. I'm saying putting aside whatever Simon Morris testified, just put that to the side --

A. Sorry. It's still not a very good line. I don't know whether it's the same --

C. DREWE

MR. WU: Okay. Let me ask others -- can we go off the record, please.

THE VIDEOGRAPHER: The time is 7:08. We're going off the record.

(Discussion held off the record.)

THE VIDEOGRAPHER: The time is 7:14. We are back on the record.

BY MR. WU:

Q. Mr. Drewe, in your opening report you made adjustments to the May 2012 Brisbane model to assess RTCM's FVLCS, correct?

A. Yes, that is correct.

Q. Okay. Now, I'm going to ask my colleague to put on the screen Table 13C on the computer. Does Table 13C reflect the adjustments that you made?

A. Table 13C reflects the adjustments that I've been able to make to the Brisbane 2012 model.

Q. Okay. And there's a column there that says -- the first column says May 2012 Bris, and does that column reflect the values in the May 2012 Brisbane model?

MR. CONWAY: Objection, form.

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A. Yes, it does.

Q. Okay. And there's a column to the right of it that says After Adjustments, right?

A. Yes, there is.

Q. It reflects the values of the Brisbane model after you adjusted them, right?

A. Yes. That's correct.

Q. Okay. Now, there are rows -- do you see the row for Teta East and the row for Minjova?

A. I do, yes.

Q. And those values or those rows, they refer to the value, the NPVs of Teta East and Minjova?

A. Yes.

Q. And in the May 2012 Bris column, the NPV for Teta East is 354 million, right?

A. Yes. That's correct.

Q. And in the After Adjustments column and Revised Value column there's only a dash for Teta East. Does the dash mean zero?

A. Yes.

Q. So in the Tete East row you

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adjusted the Tete East value to 0.

A. Yes. I've done that consistent with what Rio Tinto's accounting policies were, which was not to include -- not to include numbers that are immaterial unless there's a high degree of economic distraction.

Q. Okay. Let me ask you a yes-or-no question. In the Minjova row of Table 13.2 you've adjusted the value of Minjova to zero, correct?

MR. CONWAY: Objection.

A. I have for the same reasons.

Q. So in the -- and you see the row that says Total and May 2012 Brisbane Model?

A. Yes.

Q. And in the Revised Value column, in that row there's no value for either Tete East or Minjova, right?

A. That's correct.

Q. Now, below the Minjova row there's a row captioned Other, right?

A. Yes, there is.

Q. And with the value of negative 2.962 billion in the After Adjustments column?

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A. Yes.

Q. And this negative 2.962 billion includes the present value of developing a Greenfield Railway, right?

A. Yes. It does include that.

Q. Okay. And on an undiscounted basis the cost of developing a Greenfield Railway is forecast to be greater than 7 billion, right?

MR. CONWAY: Objection. Assumes facts not in evidence.

Q. If you need help -- if you need help, Mr. Drewe, I can refer you to figure 11C of your report.

A. Yeah. No, that's fine.

Yes.

Q. Now, do you recall that the Brisbane model assumed that more than 60 percent of RTCM's steady stage annual production would be from Tete East and Minjova?

A. I don't have that particular figure at hand.

Q. If it helps, your report, 6.4.8.

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A. Yeah. I agree with that.

Q. Okay. And the assumed production from Tete East and Minjova would enable Rio Tinto to cover the cost of constructing the Greenfield Rail, right?

MR. CONWAY: Objection, form.

A. Sorry. Could you just repeat that question?

Q. So the assumed production from Tete East and Minjova in the Brisbane model, that is what would enable Rio Tinto to cover the cost of constructing the Greenfield Rail, correct?

A. In part, yes.

MR. CONWAY: Object to form.

Q. And would you agree that RTCM likely would not have developed a Greenfield Rail without production from Tete East and Minjova?

A. That's something you would have to ask someone at Rio Tinto but, I mean, logically I would agree with you.

Q. In your adjusted version of the May 2012 Brisbane model you assume that RTCM

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would pay more than $7 billion to construct the Greenfield Rail, right?

A. Yes. Discounted value of 3 billion, yes.

Q. Now, your adjusted version of the Brisbane model includes other capital costs for particular mines, right?

A. Yes, it does.

Q. It includes capital costs for Tete East?

A. Yes, it does.

Q. And capital costs for Minjova?

A. Yes.

Q. Okay. Let's just talk about some of those capital costs for Tete East and Minjova. Would those capital costs have included costs for heavy mining equipment and large mining equipment?

A. You know, I'd have to look at the detail of the model but that's consistent with my recollection.

Q. Is it consistent with your recollection those capital costs included costs for a mine plant?

C. DREWE

A. I believe that's the case. Again, I would need to check the specific model but that is consistent with my recollection.

Q. Same question for mine infrastructure; your adjusted model included capital costs for mine infrastructure?

A. Yeah. I mean, same answer. I would need to check with my model, but that's consistent with my recollection of it.

Q. The same answer for power infrastructure?

A. Yeah. Again, I would need to check the details of the May model, but that is consistent with my recollection.

Q. And same recollection for study?

MR. CONWAY: Object to form.

A. Yeah. Again, I would need to look at the details of the May model and -- but that's consistent with my recollection.

Q. Consistent with your recollection for other -- a category of capital costs for other enabling infrastructure?

A. Yeah. Again, I would need to check the specification on the May model, but

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that is consistent with my recollection.

(Defendant's Exhibit 434, Table 13C Working, C. Drew Expert Report 12/20/2019, previously marked for identification.)

BY MR. WU:

Q. Okay. So Mr. Drewe I'm going to represent to you that Defendant's Exhibit Exhibit 434 is a working file that the SEC produced for your Table 13C. If I refer to the working file, do you understand what I mean?

A. Yes, I do.

Q. Okay. And would you agree with me that the capital costs that are included in your adjustments to the May 2012 Brisbane model would be reflected in that working file?

A. I'm not clear what you're talking about. Sorry.

Q. I'm asking -- these capital costs that we just talked about for Tete East and Minjova, to the extent that they were included in your adjusted version of the May 2012 Brisbane model, they would be reflected in the

working file that we've marked as Defendant's Exhibit 434, correct?

MR. CONWAY: Object to form.

A. Well, I mean, there's two sets of workings here; there's the specific Excel document that you're referring to here, and then there is also the application of weighting to Zambeze and the removal of the value of Tete East and Minjova.

Now, the application of the weighting and the removal of Tete East and Minjova is -- if I recall the workings file correctly, I don't think that's in there. This is exactly how Rio Tinto did the January 2013 test.

So if you take Zambeze, for example, Zambeze was included in the impairment model at its full amount and then it was adjusted upwards. So the approach I've got here is consistent with what they did in January 2013.

Q. I'm just going to put up on the screen a screen shot and it's just a screen shot of the tab entitled RTCM Consolidation.

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And it will come up in just a minute.

434B.

(Defendant's Exhibit 434B, Screenshot of: Exhibit 434, RTCM Consolidation tab, Columns A-B, Rows 1844-1847, previously marked for identification.)

BY MR. WU:

Q. Okay. This is a screen shot from Exhibit 434. We've marked it as Exhibit 434B and as the legend says it's from the RTCM Consolidation Tab.

We had understood that meaning that your adjustments to the May 2012 Brisbane model reflected this case capital costs for heavy mining equipment and large mining equipment for each of Tete East and Minjova. Is that fair?

A. I don't understand the question. But, also, I mean, I don't find that particularly helpful taking a screen shot of four rows in a spreadsheet that's got over 30 tabs that runs for thousands of lines. So I can't answer a question on the basis of a

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screen shot from four lines.

Q. Okay. Well, let me just ask you a broad question.

Are the capital costs included in your adjusted version of the May 2012 Brisbane model reflected in the workings file that were produced to the defendants in this case?

MR. CONWAY: Objection.

A. Are the capital costs reflected is the question?

Q. Yes.

A. I don't know what you mean by "reflected."

Q. If we were to try to find what the capital costs are that were included in your adjusted version of the May 2012 Brisbane model, would we be able to find them in your workings file?

A. Can I suggest that we have a look at the actual working file and then we can see the answer.

Q. Let me just ask you before we do that, you don't know how to answer that question without looking at your workings

file?

A. I mean, I repeat what I said earlier. The spreadsheet have got 30 tabs going through thousands of lines of data on most of them. You're asking me about four specific tasks on one specific tab. I'm not entirely sure what you mean by are they reflected. The answer to that question is I don't really understand.

MR. WU: We can take that exhibit down, Pat.

Q. In your rebuttal report, Mr. Drewe, you say that you agree in principle with Mr. Edwards that changing one input in a DCF model may impact other inputs in the key models, right?

A. Yes. I say that in paragraph 4.4.5.

Q. And it's for that reason that you're not able to provide a full FVLCS, right?

A. I mean, what I say at 4.4.5 is it is for this reason why I am only able to show indicative assessments of the impact of

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certain adjustments to the key models, and I am not able to provide a full FVLCS which takes into account all the inputs that would change.

Q. And in an impairment test conducted under IAS 36, you would expect Rio Tinto to calculate a full FVLCS, correct?

A. I would expect -- or they would be required to either calculate the FVLCS, or if they can't calculate the fair value less cost to sell because they didn't think they had a basis to do that, then they're required to calculate the value.

Q. Are you aware of any authority that would permit less than a full FVLCS to be used for an impairment plan?

A. It depends exactly what you mean by a full authority. I mean, the authority to make an impairment test --

Q. I didn't say full authority.

A. Apologies. What did you say?

Q. I said are you aware of any authority that would permit less than a full FVLCS to be used for an impairment test?

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A. And what do you mean by "authority" there?

Q. Could be an accounting standard. Could be any -- anything. It could be -- something in IAS or something in IFRS.

A. Okay. Well, I mean, as I was, therefore, saying, IAS 36 helps out preparing the financial statements. It explains in paragraph 23 that if you need to use computational shortcuts in arriving at your full value less cost to sell, or if you need to make approximations, then that is admitted in 36. So that would not be a fair value cost to sell assessment, to use your words.

It also says that you can use scenarios. So if you're unsure as to what -- using the words of Rio Tinto, if you're unsure as to what your cash flow is and you've got three or four or ten options, that's fine. You can do it based upon all of those and weighting them in accordance with how likely you think each of those options are.

And the final thing you said is if you have and -- and the phrase is no basis,

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closed brace, for undertaking the fair value less cost to sell, then you are -- instead you're permitted to simply do a value and use assessment.

Q. What do you mean by the phrase "full FVLCS"? That's used in your report.

A. In the context of what I'm saying at 4.4.5 of my rebuttal report "full" means complete. I haven't been able to do a complete fair value less cost to sell assessment.

Q. And you use the phrased in your report "computed NPV." Is that just a reference to the adjusted NPV you provide in your report?

A. In the context of paragraph 4.4.5, yes. What I'm saying there is that the table that we were just looking at, 13C, which is the adjustment that I am able to make in the May 2012 Brisbane model, there is such a big difference between that amount and what the carrying value was of 3.5 billion that whatever -- in my view is based on my analysis of the document and based upon my review of

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the key models, whatever those adjustments would have been, would not have increased the value by -- 5 billion-ish.

Q. Now, to provide a full FVLCS I'm just using the words in your report, you would have been required to produce an entirely new DCF model, right?

A. I don't agree that I would need to do that. I would have needed to have obtained further information, which is information that, you know, I don't have. And, therefore, I haven't been able to complete that fair value less cost to sell assessment but, as I've just said, my view based upon the models and the content for any information is that it would not have increased that computed value, the value that comes out, by 5 billion.

Q. Okay. Let's turn back to Table 13C of your report. The second-to-last row is labeled Potential Upsides and Downsides, right?

A. Yes, it is.

Q. And in the After Adjustments column for potential upside and downsides, the

value is 1.2.16 billion, right?

A. Yes. That's correct.

Q. And in the Revised Value you provide a revised value of 126 million for these potential upsides and downsides, right?

A. Indeed.

Q. Okay. And this table, Table 13C, it doesn't break out what the potential upsides or downsides are, right?

A. No. Those were taken from the January 2013 impairment paper and I explained that at 13.4.3(c)(iii).

Q. Okay. And you didn't independently quantify any of these potential upsides or downsides, right?

MR. CONWAY: Objection to form.

A. I mean, I've read how they were calculated as explained in the papers, the January 2013 impairment paper, and I concluded that, you know -- well, I concluded that it's logical that had these same upsides and downsides been considered six months earlier, then a similar amount would have been calculated.

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Q. But you did not assess these potential upsides or downsides -- let me strike that.

You didn't verify the accuracy of any of the calculations of the potential upsides or downsides reflected at Table 13C, right?

A. I mean, I read them. I'd redone part of the math as presented in the paper. But fundamentally, you know, this is -- that 136 is a number that gets recognized in Rio Tinto's 2012 financial statements. And it's a number that was provided to Rio Tinto's audit committee. And it's a number that Rio Tinto's auditors looked at. I haven't separately audited that figure, no.

Q. And I think you said before you took them from the January 2013 impairment paper?

A. Yes. That's correct.

Q. You not did independently assess these potential upsides or downsides based on information that was available as at June 30, 2012?

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MR. CONWAY: Objection. Asked and answered.

A. I haven't done an independent assessment as to whether those -- I haven't done an independent assessment on those figures.

What is clear, the specific upsides and downsides as set out in paragraph 6.4.28 of my report. So I've gone through each one of those. And looking at what most of these upsides and downsides are, many of them are referred to in the half year (indiscernible). Say, for example, the coal bed methane.

Q. All right. The potential upside and downside in your adjusted version of the May 2012 Brisbane model included production from Tete East and Minjova?

A. They included upside potential.

(Defendant's Exhibit 425, e-mail dated 11/01/2013 with attachment, previously marked for identification.)

BY MR. WU:

Q. Okay. Let's look at Defendant's

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Exhibit 425. There's a cover e-mail but does the attachment to the cover e-mail appear to be the January 2013 impairment paper that you cite in your report?

A. Yes. What you've got on the screen does. I'm just going to get my copy.

Q. Okay.

A. Okay.

Q. And I want to direct you to page 2 of the impairment paper. And you see that under the heading Revised Mineable Coal Estimate there's an Exhibit 1 entitled Changes Between November and December Mineable Coal Estimates?

A. Yes.

Q. Okay. And now I would direct you down to the text underneath Exhibit 1, and the last paragraph that starts on page 2 starting: "The most significant change..."

Do you see that?

A. I do.

Q. Okay. And so it says: "The most significant change in the 21 December estimate has been the removal of the Minjova mineable

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coal due to recently communicated laboratory results indicating the coal has been heat affected, which has diminished is calorific value and coking quality, making it uneconomic to mine using current economic assumptions."

Do you see that language I just read?

A. I do, yes.

Q. Okay. And you see that this is reporting that between November and December 2012, Rio Tinto removed Minjova mineable coal on the basis of recently communicated laboratory results?

A. I can see those words in that paragraph.

Q. Do you have any reason to doubt that that statement is inaccurate?

A. Well, this is talking about them being removed from the mineable coal estimate.

Q. Yes. Do you have any reason to doubt the voracity of that statement?

MR. CONWAY: Objection.

A. I don't doubt they've been removed from that mineable coal estimate because of

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the laboratory results that are referred to in that paragraph.

Q. Okay. Please turn to page 6 of the impairment paper. And I want to direct you to the last paragraph on that page. And the third sentence -- starting with the third sentence, which is four lines down in that paragraph. Let me just read it.

"The initial focus for RTCM has been on establishing a sound resource knowledge base from which to optimize the future mine and infrastructure development. The Minjova results were communicated in late 2012 and the early Tete East quality results are due in the first three months of 2013."

Do you have any reason to doubt that the Minjova results were only communicated in late 2012?

A. As far as I understand it, those results were confirmative of -- for example, the Project Handover report of February 2012, but those specific results I have no reason to doubt were communicated in late 2012.

Q. So your understanding is that

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these results communicated in late 2012 were only confirmative of results that were available as early as February 2012?

MR. CONWAY: Object to form.

A. Yeah. I direct you to 10.2.29(c) of my report and in particular footnote 376.

Q. Footnote 376?

A. Yes. So in 10.2.29 I say, "For purposes of my report, I've assumed that the information received by Rio Tinto in relation to Minjova in Period 3" -- it should have said late December 2012 results with which -- we're talking May -- "was largely confirmatory of the information available to Rio Tinto by the date that Rio Tinto's interim financial statements were issued. My assumption is consistent with my review of the available evidence."

And then there's a footnote coming out of that sentence.

Q. Sorry. Are you referring to the footnote 375 or 376?

A. I'm referring to 376 because 3 -- footnote 376 is talking about the information

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received in late December 2012. Footnote 375 is talking specifically about the Project Handover report and what I've assumed Rio Tinto understood with respect to Minjova at the interim.

But they are talking about what I've assumed Rio Tinto understood as the interim.

And C is talking about what was identified in late 2012, which I've assumed was largely confirmatory of the information available at the instance.

Q. And what is the basis for that assumption? Just your review of those materials or anything else?

A. I mean, yeah. It's purely an assumption, but the basis for the assumption is based on what I've read in the contemporaneous documents. Whether it's the Project Handover report or it's the documents that I referred to in footnote 376.

Q. Well, you'd agree with me that the materials cited in 376 all postdated half year 2012?

C. DREWE

A. I would agree with you. That's why I'm footnoting it and citing it as being confirmatory of what Rio Tinto had already understood by the date of the interims. So it would have to postdate the interims.

Q. Sorry. Let me just make sure. What documents from the June 30, 2012 or prior period do you believe contains information about Minjova that was just simply confirmed by the results received in late 2012?

MR. CONWAY: Object to form.

A. The information that was available in the interims included the Project Handover reports, which is referred to in paragraph -- I mean in footnote 374. And that explains that initial drilling results indicate that coal is well short of hard coking quality. Coal is more likely to be suitable for domestic applications than for export market. Current drilling is too sparse to demonstrate continuity of either seam structure of coal quality. Does not constitute a basis for coal resource estimation. There are some estimates that have been referred to.

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And then continuing on footnote 374, these estimate are considered highly likely to be reduced significantly by infill drilling, which would be expected to reveal more intense faulting, intrusions and more extensive areas of heat affected coal.

So that report was something that was known by the interim.

Now, with the footnote 376, I've explained in paragraph 10.6.30 that for the purpose of my report I've assumed that the information identified in paragraph 3 was consummative of what they knew -- was consummative of what was in the Handover report of 2012.

Q. Okay.

A. You know, that explains that.

Q. Thank you.

Is there anything else from the preJune 30, 2012 period that you're relying on other than -- for this point other than the February 2012 Handover report?

MR. CONWAY: Objection to form.

A. Depends what you mean by "for this

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point." This point in my report or the reason why Minjova is not included in the fair value less cost to sell considered as part of the upside?

Q. Why don't I do it this way. Let me introduce to you Defendant's Exhibit 71.

(Defendant's Exhibit 71, e-mail dated 42/04/2012 with attachment, previously marked for identification.)

BY MR. WU:

Q. Is Defendant's Exhibit 71 a document that you reviewed in preparing your report?

MR. FLETCHER: Aric, I think we've lost the camera for Mr. Drewe.

MR. WU: I can see him.

MR. FLETCHER: Okay. Now he's moving again, okay.

BY MR. WU:

Q. Mr. Drewe, is Defendant's Exhibit 71 a document that you reviewed in preparing your reports?

A. I don't specifically recall reviewing it, but I would hope it would have

C. DREWE

been caught by our key word search.

Q. Okay. And you did review the deposition testimony of Paul Dupree, right?

A. I did. For example, I was referring to footnote 372 of my report.

Q. Okay. Would you agree with me that the top e-mail on the first page of Defendant's Exhibit 71 is dated April 24, 2012?

A. I'd agree with you that that's the date.

Q. And that postdates the February 2012 Handover Report that we've been talking about, right?

A. Yeah. I mean, it's after that date. Yeah, I agree.

Q. We can put that to the side, Mr. Drewe.

Let me ask you about the January 2013 impairment model. One of your key models, right?

A. Yes. Yes, it is.

Q. Did the January 2013 impairment model reflect any cost for the Greenfield

Rail?

A. Yes, it did. There's two areas where it's factored in. So there is a coal chain solution. And there has been also a potential upside down to the coal chain upside extension.

Looking at page 3 of the same document we were just looking at.

Q. Page 3 of which document?

A. The January 2013 --

Q. The impairment paper?

A. Yeah.

Q. So in the coal chain solution, how much in -- how much in cost is reflected for Greenfield Rail?

A. I mean, the discounted value is 431 million. The pre-discount value --

MR. CONWAY: Aric, my system just crashed so let's go --

MR. WU: Okay. Let's go off the record.

MR. CONWAY: All right. Give me a moment.

THE VIDEOGRAPHER: The time is

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8:02. We are going off the record.

(Discussion held off the record.)

THE VIDEOGRAPHER: The time is 8:05 we're back on the record.

BY MR. WU:

Q. Mr. Drewe, I just want to make sure I understand. You believe the 431 million reflected in Exhibit 3 on page 3 of the January 2013 impairment paper is for costs associated with the Greenfield Railway?

A. I don't think that's what I said. I said that that 431 million is described as being the coal chain solution capital. And that included as part of the upside there is a coal chain upside potential.

Q. And my question is do either of those, whether it's the coal chain solution or the upside potential, do either of those relate to the construction of a Greenfield Rail?

A. Yes.

(Defendant's Exhibit 424A, Screenshot of: Exhibit 424 (RT_00234820), Discrete Values tab,

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Columns O-S, Rows 3-37, previously
marked for identification.)

BY MR. WU:

Q. Let's -- Exhibit -- Defendant's Exhibit 424 is the January 2013 impairment model and we've marked as Defendant's Exhibit 424A a screen shot from that model. And the screen shot is taken from the Discrete Values tab of the Excel file.

Mr. Drewe, do you see Defendant's Exhibit 424A?

A. Yes. I can see that.

Q. Okay. And do you see that there's a line for Sena Beira Phase 1 and the value is negative 431?

A. Yeah, I can see that.

Q. And you see that there's a separate line for Greenfield Corridor and the value of zero?

A. I can, yes.

Q. Okay. Let me ask you again, do you believe that the coal chain solution -- the 431 million referenced in Exhibit 3 on page 3 of the January 2013 impairment paper

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refers to costs for the construction of a Greenfield Railway?

A. Again, I don't think I've said that. The 431 million is described as coal chain solution capital. And then there is also an upside for coal chain -- coal chain upside potential of 620 million, which is probability weighted down to 112.

Q. So what I'm trying to understand, Mr. Drewe, is whether the January 2013 impairment model reflected any cost for the construction of a Greenfield Railway.

MR. CONWAY: Objection, form.

A. The impairment model -- I mean, you can see that on your Exhibit 424A. I don't think I've said that it did. The cost of the Greenfield Railway, again, is included in the upside -- under coal chain upside potential, which isn't in the impairment model but I can point it out for you if you need me to.

Q. So you're looking at -- help me out. On Exhibit 3 on the January 2013 impairment paper, you're looking at the bottom

C. DREWE

chart that says Upside and Coal Chain Upside Potential?

A. Yes. There's a figure of 620 million, with a probability of 18 percent of which RTCM percentage therefore is 112. So that's the weighted amount of that.

If you then follow where that refers to, which is Appendix C, and turn to page 16 of the document, the section -- the section of the upside and downside is called Alternate Coal Chain Solutions that matches the words on the upside and downside that we just looked at, there's a table, Exhibit C-1, and the third line on that table is Large Scale Greenfield Solution with a figure of 1,420, an incremental value of 8.9, a probability of 5 percent, and a weighted incremental value of 14.

And above the table it explains what that relates to. So there's 5 percent probability that a regional consortium engages in the development of a Greenfield solution that reduces infrastructure costs $30 per ton, et cetera.

C. DREWE

So that is the potential upside from a coal chain solution, which includes a large-scale Greenfield solution.

Q. Okay. Thank you. And the value assigned it to in the January 2013 impairment model, is that the 40 million?

A. Yes. As we were talking about with IAS 36, because it allows you to run different scenarios and weight them. Exactly what we have done here. So exactly what IAS 36 is looking for. The full value is 1.4 billion with a weighting applied to it ending up at 40 million.

Q. And your adjusted version of the May 2012 Brisbane model, the value that you assigned to a Greenfield -- a large scale Greenfield solution is not 40 million, right?

Sorry. Not the -- the -- yeah, the value that -- the cost that you assigned to -- the cost assumption for the construction of a Greenfield Rail that's assumed in your adjusted model, what was the cost assumption?

A. I think from memory it was the 7 billion figure that we were talking about

C. DREWE

earlier but that doesn't compare with the 40 million, just to be clear.

Q. Okay. And what would be the apples-to-apples comparison to the 40 million?

A. Well, included -- so firstly you need to unweight it. You need to go back to the 1,420. So included with the 1,420 will be the cost of the Greenfield Railway solution. Not particularly set out in this document. So you'd need to look at the mobile there.

But in addition to the cost of that Greenfield Railway solution, there is an increase in production, an extra 17 million tons per annum.

So it's a component of the 1,420 figure, but it's not that 1,420 figure. There's some additional costs.

Q. So let's go back to the Table 13C of your report. For the Zambeze row there's a 75 percent weighting figure. Is that right?

A. Yes. That is correct.

Q. Okay. And you take the 75 percent weighting directly from the January 2013 impairment paper, right?

C. DREWE

A. I did in the paragraph before and I explained why.

Q. Okay. You did not independently calculate this weighting of Zambeze value.

MR. CONWAY: Objection, form.

A. I've relied on Rio Tinto's assessment. They explained to me pen and paper why that 75 percent was applied because the project was still in the conceptual phase. Significant all party knowledge and further study work is required. Hence, my conclusion is simply that had an impairment test been undertaken at the interim, a weighting of 75 percent, if not less, would have been applied given -- yeah, it's earlier in time and, therefore, it's -- if the weighting was because of the amount of knowledge that was known about Zambeze, six months earlier even less would have been there.

Q. Okay. I want to turn to some of the economic assumptions that you discuss in your reports. One of those assumptions is the applicable discount rate, right?

A. Yes, it is.

C. DREWE

Q. And if I understand your reports correctly, you understood that RTCM was required to apply the discount rates from Rio Tinto economics -- or provided by Rio Tinto economics in its valuation modeling, right?

A. Yeah. I mean, compared to -- according to -- you know, for a model that was prepared in accordance with PEG.

Q. And the discount rate that was used in the Brisbane model was 9 percent, right?

A. Yes. That's correct.

Q. And in your assessment of FVLCS for RTCM in half year 2012, you adjusted the discount rate in the Brisbane model and applied a rate of 7.9 percent, right?

A. That's correct, yes.

Q. And you made that adjustment to reflect the discount rate of a market participant, right?

A. Yeah. Again, correct.

Q. Okay. And --

MR. CONWAY: Aric, whenever is a good time for a break, we've been going

C. DREWE

over an hour.

MR. WU: Okay. Let me just get through the discount rate stuff and then stop.

MR. CONWAY: Sure. Sure.

MR. WU: Okay.

BY MR. WU:

Q. Now, your report doesn't define the term "market participants." Can you tell us what you mean by a market participant?

A. A market participant is a hypothetical buyer that you're assuming will be purchasing the assets that you're valuing.

Q. Anybody else?

A. Do you have someone in mind?

Q. No. I'm just asking whether by market participant you consider anybody other than a hypothetical buyer.

A. Well, you're considering the people that hypothetically would be interested. But, I mean, it would also include people that actually are interested. It's someone who's operating in the market.

Q. So how would somebody go about

C. DREWE

determining what assumptions a market participant would use?

MR. CONWAY: Objection to form. Vague.

A. There's different ways that you can calculate a discount rate. There's various different models you can apply. Capital asset pricing model. A weighted average cost of capital.

I'm just going to remind myself in Section 9.

I do recall a document. I'm just looking for the reference to it in which -- ah, footnote 323 on page 127 of my report.

That refers to a particular e-mail from Mr. Brewster to Mr. Elliott in September 2012. The subject WAC there is the weighted average cost of capital, which refers to the impairment calculations. And that sets out Rio Tinto's calculation for the year-end 2012 of the market participants.

What I explain in 13.4.3 is -- at specifically footnote 461, I say, "My analysis suggests the applicable discount rate at 30

C. DREWE

June 2012 may actually have been higher. This would decrease the computed NPV."

So I've been prudent -- or giving Rio Tinto the benefit of the doubt by using a discount rate of 7.5 percent at September 2012, albeit it might be that actually it had its impairment taken at the interim a higher discount rate would have been required which would mean the higher the discount rate, the lower the computed NPV.

Q. What analysis did you undertake to assess the applicable discount rate at 30 June 2012?

A. All I simply did was I took what Rio Tinto did, which is market data. The way you work out your weighted average cost of capital is you work out a cost of debt, you work out a cost of equity, and you weight depending on the capital structure.

So I did the same -- I took Rio Tinto's calculation, the same comparisons that they used, and I simply rolled it back.

And I believe as well the discount rate for the impairment calculation at the end

C. DREWE

of 2011 were around 7.9 percent as well.

Q. Let me ask you this. In determining the standards of a market participant, would you consider the views of research analysts?

MR. CONWAY: Objection, form.

A. In order to come up with a discount rate?

Q. Sure. Start there.

A. I mean, I guess theoretically you could do but I'm not entirely sure why you would do.

Q. Why wouldn't you consider -- or use a research analyst?

MR. CONWAY: Object to form.

A. The weighted average cost of capital is a -- you can pull that off Bloomberg. I don't need to go to an analyst to ask him to calculate it for the me. It's market data that's available on listed companies.

So the basis -- the basis that Rio Tinto did it, I haven't looked at that e-mail since Mr. Brewster for a few months. But my

recollection is that it's not based on analyst reports. It's simply based upon a number of comparison companies and then a fairly standard WAC calculation.

Q. And that e-mail is from September 2012, correct?

A. It is. And that's why in the analysis I referred to at footnote 461, I simply just roll it back three months.

MR. WU: All right. That's a good place to take a break. Just off the record.

THE VIDEOGRAPHER: The time is 8:23. This is the end of media labeled number four. We are going off the record.

(Recess taken.)

THE VIDEOGRAPHER: This is the start of media labeled number five. The time is 8:46. We are back on the record.

BY MR. WU:

Q. Mr. Drewe, before the break we were talking about discount rates and you

C. DREWE

mentioned -- you pointed out that in one of your footnotes you had referenced an analysis that you had undertaken of applicable discount rates.

Did your analysis include a review or reference to any documents that were not Rio Tinto documents?

A. It was based on market data.

Q. Market data contained in the e-mail that you had mentioned or market data from some other source?

A. I can't actually recall sat here now. I mean, it would be helpful to see that Brewster e-mail if possible. That might remind -- it would -- that would help. But, I mean, I can't specifically recall sat here now.

Q. Okay. Let me ask you something else. I think a couple times today you've mentioned -- I think you called it a value and use analysis. Do I have that right?

A. Yes, you do. Yeah.

Q. Okay. And in this matter, in this case, you haven't provided a value and use

C. DREWE

analysis in either of your reports, right?

A. I haven't. I've assumed specific issues, you might say, that are fair value less cost to sell assessment computed for in the interims.

But, you know, as we said earlier today, if that not be the case then a value and use would instead be required. The reason I didn't use a value and use in my report was -- is simply because the value and use would only include the current operations of Benga. The cap I think is 2.50 million tons per annum. The value of that I think is around 100 million. Again, it wouldn't change my conclusions. That wouldn't be a material event.

Q. So one of the -- getting back to your adjusted version of the May 2012 Brisbane model, one of the economic assumptions that you address is long-term commodity pricing, right?

A. Yes. That's right.

Q. Okay. So I guess my question is with respect to long-term commodity price

C. DREWE

assumptions, is it also necessary to apply a market participant standard?

MR. CONWAY: Object to form.

A. That is what IAS 36 requires. The accountant policies disclosed in Rio Tinto's financial statements explain how they get to a market participant view on long-term commodity prices, which is Rio Tinto's own view in the short to medium term. And then in the long term rather than continuing to reflect any adjustments, they apply a flat fee.

So the answer to your question is yes, it is market participants but Rio Tinto have explained in their accounting policies how they get to that market participant.

Q. And did you rely on any non-Rio Tinto sources in assessing the long-term commodity price assumption?

A. I didn't, no, because the Controller's Manual requires the impairment test to be undertaken in accordance with PEG and PEG requires the use of the long-term commodity prices as issued by Rio Tinto's economics department.

C. DREWE

And so those are the ones that I've referred to.

Q. And you say the accounting policies disclosed in Rio Tinto's financial statements explain how they get to a market participant view on long-term commodity pricing.

Do you know if Rio Tinto, in getting to a market participant view, looks to non-Rio Tinto sources?

MR. CONWAY: Object to form. Vague.

A. Well, I mean, what I can go on is what they did in the January impairment -- in the January 2013 impairment test. And as shown on Table 9A, page 118, January 2013 impairment test is taken from the latest PEG data.

Q. Let me just make sure -- let me just ask you one more market participant question. In your mind is the assumption of a market participant different than the assumption -- than an assumption made by Rio Tinto in the context of assessing FVLCS?

C. DREWE

MR. CONWAY: Objection, form.

A. Is your question is there a difference between Rio Tinto and a market participant?

Q. Is the assumption of a market participant different than an assumption of Rio Tinto in the context of assessing a FVLCS?

MR. CONWAY: Objection.

A. It depends on exactly what input you're looking at. So, for example -- well, we're talking about discount rate. With a discount rate the market participants won't necessarily have, for example, the same capital structure as Rio Tinto. And that's why, when looking at what discount rates we use in the impairment test, a market participant and not Rio Tinto, it's a wise approach.

In relation to commodity pricing, you would need to logically ask why would a market participant be able to obtain a different price than the price that Rio Tinto thinks it can obtain. So that there might be reasonable reasons for that. I don't know.

C. DREWE

That's not my field of expertise.

But it's also not unreasonable to conclude, as Rio Tinto do, that a market participant's view on commodity pricing is the same view as that reached by the experts in Rio Tinto's economic department.

Q. I just want to understand that last sentence. You just said it's not unreasonable to conclude, as Rio Tinto does, that a market participant's view of commodity pricing is the same view as that department? Is that what you said?

A. I don't have the live feed. I mean, that's broadly what I'm saying. That's broadly what their accounting policies state, that in order to get the market participants' prices, they use Rio Tinto's or management's view in the short to medium term and they explain what they do in the long term and why.

Q. You don't know as a factual matter whether Rio Tinto concludes that a market participant's view on commodity pricing is the same view as -- I'm not sure which department you were talking about -- but the Rio Tinto

C. DREWE

department?

MR. CONWAY: Objection, vague.

A. I don't know -- I don't know what basis the -- the economics and marketing department have at Rio Tinto. I don't think there's much more I can say on that.

Q. So let's turn to Section 5.6.1 of your report.

A. Okay.

Q. You say that the Plan NVPs are only the starting point for assessment of FVLCS. Adjustments are then required to ensure that the FVLCS was assessed using the assumptions of a market participant and not of Rio Tinto.

So let me just try to figure it out. Are you saying that the assumptions of a market participant are typically not those of Rio Tinto, never those of Rio Tinto, or sometimes not of Rio Tinto?

I'm just trying to understand at least in this sentence you sort of distinguish between a market participant and Rio Tinto.

So I'm just trying to understand

C. DREWE

what distinction you're drawing between a market participant and Rio Tinto.

MR. CONWAY: Objection, form.

A. The fair value less cost to sell according to IAS 36 is based on a market participant -- a market participant's assumptions.

Now, how Rio Tinto arrived at those market participant's assumptions is explained in part in their accounting policies and in some regard -- well, for many assumptions Rio Tinto uses its on assumptions as being what a reasonable market participant would conclude.

Q. And if I understand correctly, you, in ascertaining -- in applying assumptions of a market participant, you did not independently determine what any such assumptions would be. You took what you believed Rio Tinto would have used as a market participant assumption. Is that right?

MR. CONWAY: Object to form.

A. I identified the adjustments to the Plan NPV that Rio Tinto made in order to

C. DREWE

arrive at market participants.

Q. So did you independently evaluate each assumption by a market participant standard sort of separate and apart from what Rio Tinto determined that assumption ought to be?

MR. CONWAY: Objection, form. Asked and answered.

A. No, I didn't do an assessment on each individual one, primarily because the accounting policies disclosed in Rio Tinto's financial statements explained how they get to the market participants' assumptions in a fair value less cost to sell.

For example, they refer to the starting point in effect to find NPV. They explain how they get to the commodity price.

Q. And do you know as a factual matter whether for commodity pricing Rio Tinto considers, for example, what equity research analysts say -- are saying about Rio Tinto?

MR. CONWAY: Objection, form. What time period?

Q. Back in the relevant time period.

C. DREWE

A. I don't know what Rio Tinto's economic department referred to do when they identified their commodity pricing. I guess my report is assuming they're looking at the relevant information and forming -- you know, they're the in-house experts at Rio Tinto on commodity pricing. I think it's fairly reasonable to rely on them as indeed Rio Tinto did do contemporaneously and indeed as was required in Rio Tinto's project evaluation guideline.

Q. So I just want to understand what you assumed. Are you assuming that Rio Tinto only considered what its in-house experts believed to be proper commodity pricing?

A. No. I'm assuming that had Rio Tinto undertaken any plan test they would have done that in accordance with, amongst other things, the Controller's Manual and the stated accounting policies.

What the accounting policies explain is that commodity pricing is based upon management's short-term and medium-term view and that as a long-term view they simply

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flatten the fee on margin because that's what they anticipate a market participant would do.

What the Controller's Manual states from recollection is that PEG is the -- is what is required to be followed unless there are changes that are required. And PEG requires the use of modest pricing. And the final of all that is this is what happened in the January 2013 paper and therefore it's not unreasonable to assume that's the same basis that Rio Tinto would have followed.

Q. I'm just asking you do you know if Rio Tinto's in-house experts consulted external sources in considering long-term commodity pricing?

A. Sat here today, I don't know. I don't know generally.

Q. Okay. And I take it you didn't assess -- you didn't independently assess the reasonableness of PEG pricing assumptions; is that correct?

MR. CONWAY: Objection to form. Vague.

A. No. I mean, I assessed the

C. DREWE

reasonableness of the key models by reference to the prices that have been circulated by the economic department.

Q. Okay. And I want to talk about the July 2012 reference case model. As part of your analysis of that model you made long-term assumptions for the commodity price assumptions for that model, right?

A. Yes. That's correct.

Q. And those adjustments were to use PEG pricing assumptions at the time.

A. Yes. As required by PEG.

Q. And in Section 9.2.14 of your report you say that the reference case model -- that the hard coking coal forecasts that were included were at US $200 per ton and thermal coal price forecasts were $115 per down from 2013 onwards.

Do you see that?

A. Yes, I do.

Q. And, again, you just -- you have no independent opinion on whether those assumptions were consistent with those of a market participant; you just adjusted using

C. DREWE

the PEG pricing, correct?

MR. CONWAY: Object to form. Vague.

A. If you look at the paragraph below that, an e-mail at the time in July 2012 describes those prices. So there's the 200 US dollars per ton and $115 per ton and they were described as being upside prices. On the basis that they're expressed as upside prices, yeah, I assumed that they were upside prices.

(Defendant's Exhibit 418, Citi Research Report dated 8 August 2012, previously marked for identification as of this date.)

BY MR. WU:

Q. Let me -- let's take a look at Defendant's Exhibit 418.

Are you there, Mr. Drewe?

A. Yes, I am.

Q. Okay. And Exhibit 418 this appears to be a Citi research report regarding Rio Tinto dated August 8, 2012.

A. Yeah. That's what it looks like.

Q. Can you turn to page 8 of the

C. DREWE

report. And I want to direct you to the table in the upper right-hand corner, the chart entitled Commodity Price and Exchange Rate Assumptions.

Do you see there are rows for thermal coal and coking coal?

Do you see that?

A. Yep.

Q. Okay. And the thermal coal row, just looking at that first, reads 119 US dollars per ton for 2013, correct?

A. Yes. I can see that.

Q. And for 2014 as well, also 119 per ton.

A. Yes. I can see that.

Q. And that's greater than the $115 per ton thermal coal pricing assumption for 2013 and 2014, the reference page model, right?

A. We're not looking at the same period, though. Paragraph 9.2.6.8 describes the upside.

Q. Yeah, but I'm talking about 9.2.1.4.

C. DREWE

A. Okay.

Q. Do you see in 9.2.1.4 you say that the thermal coal price forecast for the reference case models were $115 per ton for 2013 onward?

A. Yes. I do see that.

Q. And you'd agree with me in the Citi report that the thermal coal price forecast for 2013/2014 was higher, $119 per ton.

MR. CONWAY: Objection, foundation.

A. In relation to this one particular report I can see that the '13 and '14, those figures are higher. The --

Q. Okay. That was my question. That's all my question was.

MR. CONWAY: Mr. Drewe, did you finish your answer?

THE WITNESS: No, I haven't.

MR. CONWAY: Aric, I'd ask that you allow him to --

A. What I was trying to say was in 9.3.15, the upside prices that are being

referred to are from 2020 from 2025 onward. Not from 2014.

So the upside prices, this didn't particularly help us with that e-mail.

Q. Okay. But I wasn't asking about that e-mail. And I didn't ask you about 2025 onward. Okay? My question is about 2013 and 2014. Okay? Is that okay?

A. Yeah. That's fine. I mean, I don't think that e-mail is very relevant --

Q. I'm not -- so just to be clear, my next couple questions are not about the e-mail cited in 9.2.1.5. They're cited about -- they're concerned a comparison to the price forecast included in the July 2012 reference case model referenced in 9.2.1.4, okay?

A. I understand.

Q. Okay. And in the Citi report do you see the row for coking coal?

A. Yes, I do.

Q. And for 2013 it has $224 per ton, right?

A. Yes.

Q. And for 2014 it has $226 per ton,

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right?

A. Yes. That is correct.

Q. And that's greater than the $200 per ton for coking coal price assumptions that were used for the July 2012 reference case model, right?

A. Yes. That figure is higher than that figure.

Q. Okay. And do you dispute that the thermal and coking coal price assumptions in the Citi research report reflect those of a market participant in August 2012?

MR. CONWAY: Objection, form. Foundation. Vague.

A. Well, I mean, I don't specifically know what this report is. I mean, obviously, I can read what it says on the front cover.

This looks like these are the assumptions which are underpinning the valuation of Rio Tinto at that point in time. So as at 8th of August 2012.

As to whether that's what the market participants might -- a hypothetical purchaser of RTCM, whether that's the

C. DREWE

assumptions that they would have adopted, I'm not sure that is necessarily the case.

As to why it differs from what Rio Tinto's own experts are saying, I don't know why it's the case. You would have to ask them.

You know, fundamentally, in an impairment test, the requirement was it was related to management's best estimate and that's what Rio Tinto disclosed to the market. Management's best estimates were as determined by their economic department, not by one individual at Citibank to work out the value of Rio Tinto at the 8th of August.

Q. Would you agree with me that the price assumptions in the July 2012 reference case model were not reported in Rio Tinto's public financial statement?

MR. CONWAY: Objection, form.

A. The specific figures weren't but Rio Tinto was disclosing that they were the basis of their impairment test so whether they reported specific figures, they do report they're using their best estimates.

C. DREWE

Q. Okay. So now your rebuttal report provides adjustments to the June 2012 five-year plan and the July 2012 reference case models, right?

A. Yes. That is correct.

Q. And you made the same basic adjustments to those two models as you did the Brisbane model in your opening report?

MR. CONWAY: Objection, form.

A. Yes. In broad summary they were the same adjustments.

Q. Okay. You also discuss in your reports what you call the physical assumptions related to RTCM, right?

A. With apologies. Could you just repeat that question?

Q. You discuss in your reports what you call the physical assumptions related to RTCM?

A. Are you referring to Section 10 of my first report?

Q. Yes.

A. Yes.

Q. And in Section 10 of your report

C. DREWE

you address certain physical assumptions related to Tete East, right?

A. Yes. Yes, I do.

Q. And you conclude that the physical assumptions related to Tete East in a number of its key models were unreasonable; is that right? And if it helps, I'm looking at 10.4.1.

A. Yes. That what's I state there. And within the body of 10.2 I explain the basis upon which I've made that assessment, which is by looking at what Rio Tinto contemporaneously was saying about Tete East, for example, as reflected in its contemporaneous e-mails, reports, and presentations.

Q. Now, you also address certain physical assumptions related to Minjova; is that right?

A. Yes, I do.

Q. And you conclude that certain physical assumptions related to Minjova in a number of the key models were unreasonable, right?

C. DREWE

A. Yes. And, again, that is considered in the context of the specific points that I set out at 7.3.4.

Q. And you ultimately conclude that the life of mine production assumptions for both Tete East and Minjova were unreasonable on a number of key models, right?

A. I conclude that they weren't compliant with what PEG required purportedly for the purposes of what my work is, which is considering the outcome of an impairment test, according to Rio Tinto's own accounting policies.

Q. Let me ask you specifically about the May 2012 Brisbane model. You concluded that the production volumes for Tete East and Minjova, the production volume assumptions for Tete East and Minjova were not reasonable, right?

A. My reasons in relation to Tete East are in 10.2.27. And in relation to Minjova, they're in 10.2.29(b). And the following --

Q. And I'm just trying to understand

C. DREWE

what I've read in those paragraphs. Am I right that you concluded that the production volume assumptions for Tete East and Minjova in the May 2012 Brisbane model were not reasonable?

MR. CONWAY: Object to form.

A. Well, considering what those production volumes are in the context of, that's why I gave you the paragraph reference to 27, in the context of Rio Tinto's contemporaneous valuation guidelines of PEG, the requirements of the fair value less cost to sell assessment undertaken in accordance with IFRS and Rio's Controller's Manual --

(Discussion held off the record.)

A. My consideration of the reasonableness of the production assumptions for both Tete and Minjova is in the context of Rio Tinto's contemporaneous valuation guidelines including PEG, the requirements to the fair value less cost to sell assessment undertaken in accordance with both IFRS and Rio Tinto's Controller's Manual, and the available evidence of the facts and

C. DREWE

circumstances that I understood existed at the time.

But that was the basis for the conclusions on the production assumptions for both Tete East and Minjova.

Q. And to be clear, you did consider the reasonableness of the production assumptions for both Tete East and Minjova.

MR. CONWAY: Objection, form.

A. I have considered the reasonableness for them in the context of those three things which I've just read out, which are set out, amongst other places at 7.3.4 of my report.

Q. And in the context of those three things that you just read out, you concluded that the production assumptions for both Tete East and Minjova in the May 2012 Brisbane model were unreasonable.

A. Yes. For the purposes of a comparison.

Q. Okay. Thank you.

Your report discusses what you call the RT share related to the RTCM assets.

C. DREWE

Do you know what I mean by that?
A. I do, yes.
Q. Okay. And am I right that you concluded the assumptions in certain of the key models regarding Rio Tinto's ownership of Minjova do not appear reasonable?
A. Yes. I mean, that's a summary of what I've concluded, but, again, it needs to be read in the context of what I set out at Section 8.3 of my report.
Q. And one of the reasons for your conclusion is that you believe the maximum shareholding Rio Tinto could have acquired in Minjova was 80 percent under a shareholder's agreement, right?
A. That was my understanding of what Rio Tinto contemporaneously understood.
Q. But you reviewed Mr. Edwards' report, right?
A. I did, yeah.
Q. And you saw that his reading of the shareholders agreement was that the original owners would sell the remaining 20 percent of Minjova -- of the Minjova interest

C. DREWE

to Rio Tinto by default, right?

A. I saw that was Mr. Edwards' --

MR. CONWAY: Objection to form.

A. -- conclusion, yes.

Q. And in your rebuttal report you didn't respond to that aspect of Mr. Edwards' report, right?

A. I believe I did.

Q. All right.

(Pause on the record.)

Q. Look, Mr. Drewe, if it helps, irrespective of where it might be in your rebuttal report, can you just tell me the substance of what your response was to Mr. Edwards?

A. Yeah, sure. The important point from an impairment test perspective is not what -- is not what Mr. Edwards or I or a lawyer concludes now looking at the particular shareholders agreement. The important point is what Rio Tinto contemporaneously concluded. And that is what I explain in my main report at paragraph 8.3.11.

I understand at the date of the

C. DREWE

May Brisbane model, Rio Tinto had at that stage acquired 40 percent of Minjova and it had the right to increase that to 80 percent. And I explained that in the context of a fair value less cost to sell assessment it seems reasonable to, therefore, include that 80 percent if that was what management's expectations were at the date of an impairment test, and subject to the relevant cash outlay for purchasing that additional 40 percent being included.

If Rio Tinto was considering at the date of the interim or expected at the date of the interm that actually it would end up acquiring 100 percent of the -- of Minjova, which, as Mr. Edwards has pointed out, there is a clause in the option agreement, which subject to certain conditions being met, you know, that they might have ended up obtaining all of that, then it wouldn't be -- well, that additional 20 percent certainly could be reflected in a central -- well, in a fair value less cost to sell assessment, if that's what management's best estimates were at that

point in time.

But the two relevant considerations are, number one, it's not a certainty that more than 80 percent will be purchased because if it's not then that would require risk weighting to reflect management's best estimates.

But most importantly, the additional 20 percent, as far as I understand the clause Mr. Edwards is pointing to, requires that final percentage to be purchased at the, in effect, market value. And, therefore, in order to include the additional 20 percent of production from Minjova in a valuation of the RTCM CGU, you would need to include the cost that it would acquire that 20 percent for.

And if, for the sake of argument, you're assuming that Minjova was worth a bit -- you know, a hundred percent of a Minjova was worth a billion, if you're including 80 percent of that, then clearly that would be 800 million.

If you're then assuming that you

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were going to purchase that additional 20 percent, then I can see -- I can see as a matter of logic that you may be able to include that additional 200 million, but you would also need to include a cash outlay of 200 million to purchase that 20 percent.

Fundamentally, what this comes down is to what Rio Tinto's estimates and best estimates and expectations were at the interim. And according to the documents that I see including the document referred to at 10.3.10(a) I had understood that Rio Tinto had itself understood that the maximum equity was 80 -- under the joint venture wsa80 percent.

Q.   And your assumption is just based on the document you cited at 8.3.10?

A.   My -- yeah, my assumption of -- they had understood that they could acquire 80 percent is -- yeah, is based on what's in 10.3.10(a) for the reasons I explained in relation to that 20 percent and the additional cash outlay needed to be included, it actually means that even if you include a hundred percent you've got to -- you've in effect got

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to take out 20 percent because that meant you have yet to pay the 20 percent.

Q. And was your assumption based on any deposition testimony that you read?

A. No. Not -- no, it wasn't.

Q. Your report also discusses assumptions related to coal transportation infrastructure, right?

A. Yes, it do.

Q. And one of the transportation infrastructure assumptions you considered was the sale of fair transport capacity on Greenfield Rail, right?

A. Yes, indeed.

Q. And one of the opinions you're providing in this case is that the assumptions in some key models regarding the sale of fair transport capacity on Greenfield Rail were unreasonable; is that right?

A. Again, I think it's just helpful to identify the basis for my assessment of the reasonableness, the factors set out at 7.3.4 of my report.

Q. Okay. And in that context, but

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just did you consider -- did you assess the reasonableness of the assumptions and the key models regarding the sale of fair transport -- of transport capacity on Greenfield Rail?

A. Yes. In those context -- in that context.

Q. And in that -- in the context you concluded that the assumptions were unreasonable, correct?

A. Yes. And I refer to 11.5.4 where I explain the basis for that conclusion.

Q. So we've talked today about the January 2013 impairment test. Do you know what I'm referring to when I say the January 2013 impairment test?

A. Yes, I do.

Q. And do you believe the January 2013 impairment test was the best evidence of how Rio Tinto would have undertaken an impairment test at half year 2012?

MR. CONWAY: Object to form.

A. I do agree that it's -- it's good evidence of how they undertake impairment, yes.

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Q. Okay. Is it also in your view the best evidence?

MR. CONWAY: Object to form.

A. You'd have to just point me to in my report where I state that. From recollection I use similar words but I would need to be shown the paragraph from my report.

Q. Regardless of what words you used in your report, in substance do you think the January 2013 impairment test was the best evidence of how Rio Tinto would have undertaken impairment tests of RTCM's assets at half year 2012?

MR. CONWAY: Objection, form. Vague.

A. I think that combined with the stated accounting policies and the Controller's Manual and the other documents that I referred to in Section 5.

Q. And surely -- let's just make sure I understand that. You did rely on the January 2013 impairment test in your assessment of RTCM's FVLCS at half year 2012, right?

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A. Yes, I did.

Q. I think you testified earlier that Rio Tinto released its half year 2012 results in August 8th, 2012, right?

A. I think it was you that told me that. It sounds about right.

Q. Okay. It sounds about right now?

A. The date that they released their accounts? The interim.

Q. Correct. The date that they released their half year 2012 results.

A. Yes. It sounds about right. I haven't checked it.

(Defendant's Exhibit 376, Reuters Investing News July 24, 2012 Anglo moves into Mozambique coal with $555 mln deal, previously marked for identification.)

BY MR. WU:

Q. Okay. Let's look at Defendant's Exhibit 376.

Do you have that in front of you?

A. Yes, I do.

Q. Okay. And this is a -- it's an article dated July 24th, 2012 entitled Anglo

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moves in Mozambique coal worth 555 million deal.

Have you seen this document before?

A. Not that -- I'm sorry. My camera just got off. Let me just fix that.

Okay. Sorry.

Not that I specifically recall.

Q. Okay. You see on the first page of the document it says that Anglo American has agreed to buy a majority stake in a coal project in Mozambique for 555 million?

A. I do, yes.

Q. And on page 2 -- if I could direct you to page 2, the third paragraph on the bottom says, "Analysts welcomed the deal in a country many see as an attractive mining and tax regime and a prime location for shipping to Asia."

Do you see that?

A. Yes, I do. I was just reading the paragraph that follows it. But -- which says it's too early to judge the deal but I agree you just read that paragraph on that.

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Q. Okay. And do you have any reason to doubt that in July 2012 analysts believed that Mozambique had an attractive mining and tax regime and was a prime location for shipping to Asia?

MR. CONWAY: Objection, form. Foundation. Vague.

Q. Go ahead and answer.

A. This is one -- yeah, I agree that that's what it says. I believe this is a deal that actually didn't go through.

Q. Okay. But my question was do you have any reason to believe that at that time in July 2012 analysts believed that Mozambique had an attractive mining and tax regime and was a prime location for shipping to Asia?

MR. CONWAY: Object to form, foundation. Vague.

A. I mean, I haven't seen those analysts' reports and it depends on -- you know, as I indicate in the next paragraph it does say, "Several, though said it was too early to judge the deal and its price tag, as Anglo has yet to give an indication of the

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cost of the developing the project..." et cetera, et cetera.

Q. So is the answer to my question you don't have any basis to assess whether that's what analysts believed in July 2012?

MR. CONWAY: Objection, form. Foundation.

A. I don't have any basis to say whether this one news article is wrong one way or the other.

(Defendant's Exhibit 421, Reuters Investing News November 7, 2012 Vale cuts 2012 Mozambique coal output, export target, previously marked for identification.)

BY MR. WU:

Q. Okay. Well, let's look at Defendant's Exhibit 421. Are you there?

A. Yes, I am.

Q. Okay. Exhibit 421 is an article dated November 7, 2012 entitled Vale cuts 2012 Mozambique coal output, export target.

So on page 1, just at the beginning of the article it says, "Vale has

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almost halved its output and export target at its Moatize coal mine in Mozambique for this year to 2.6 million tonnes due to limited capacity on the railway connecting the mine with the Beira port..."

Do you see that?

A. I do, yes.

Q. Were you aware that Vale cut its export target for Mozambique by almost half in November 2012?

MR. CONWAY: Object to the form. Foundation.

A. Again, this is one news article. I don't know -- yeah, I can't really comment upon what Vale did or didn't do during 2012 for the purposes of an impairment model, because the key point is what Rio Tinto's expectations were at the time, not what is identified in a news article.

Q. Would you agree that Vale was the largest coal operator in Mozambique in late 2012?

MR. CONWAY: Objection to form. Foundation.

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A. I mean, it depends what you mean by "largest."

Q. That it had the largest coal operations in Mozambique in late 2012.

MR. CONWAY: Objection, form.

A. I'm not sure I have the data to analyze that. 2.6 million, at that stage I can't recall specifically what Benga was producing annually.

Q. Well, with that caveat, would you agree that Vale has one of the largest coal operations in Mozambique in late 2012?

MR. CONWAY: Objection, asked and answered. Lacks foundation.

A. I don't have enough data to identify who had the largest operation in Mozambique in 2012.

(Defendant's Exhibit 422, Macquire Commodities Research report Met coal in recovery mode, previously marked for identification.)

BY MR. WU:

Q. Okay. Let's turn to Defendant's Exhibit 422.

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Do you have that in front of you?

A. I do, yeah.

Q. This is a Macquarie Commodities Research Report dated November 12, 2012.

Do you see that?

A. I do, yeah.

Q. And are you familiar with Macquarie?

A. I have come across them before, yeah.

Q. They're an investment bank, right?

A. That's consistent with my understanding.

Q. All right. Let's turn to page 2. And I want to look at the second bullet on the top of the page. I'm just going to read the second half of that bullet. "Having spent much of the year trading between 210 to $225 per ton FOB Australia, during Q3 both international and domestic hard coking coal prices dropped rapidly. With de-stocking of raw materials by large Chinese steel mills as finished goods inventory tied up working capital affected met coal just as much as iron

ore, and for international suppliers this meant the market of last resort was no longer buying."

Do you see that?

A. Yes, I can see those words.

Q. And that's saying the hard coking prices dropped dramatically in the third quarter of 2012, right?

MR. CONWAY: Objection, form. Foundation.

A. I mean, I haven't read this report in detail. That's what that paragraph appears to say, which is different to what Rio Tinto's contemporaneous expectations were during that quarter 3 as included in their -- as determined by their economic department.

Q. Which document do you have in mind if you have one in mind?

Hold on one second. I think I might have just lost my feed.

MR. WU: Can we go off the record. I've just lost feed.

MR. CONWAY: Aric, we've been going a while. Can we take a break?

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MR. WU: Sure, sure. Let's go off the record.

THE VIDEOGRAPHER: The time is 9:47. This is the end of media labeled number five. We are going off the record.

(Recess taken.)

THE VIDEOGRAPHER: This is the start of media labeled number six. The time is 10:08. We are back on the record.

BY MR. WU:

Q. Mr. Drewe, other than your assignment in this case, have you previously ever carried out an impairment test of coal assets?

A. I've considered the recoverable amount of investments in mining companies.

Q. Were those coal mining companies?

A. I couldn't say. I would need to go and check. I can think of some of them that aren't, but I can't say that none of them were.

Q. Which are the ones that you think

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might be coal mining companies?

A. Well, I acted, for example, for another investment fund, which had had its -- which had been suspended by the regulator in the relevant country in which it was licensed to act. That investment fund put investments into -- I think it was fixed funds from recollection. One of them was exclusively in mining companies. I can't remember sat here today, what the mining companies were, whether they were coal or not.

My role in that case is in the context of those regulated proceedings was to analyze the cash flows of the investment funds into the various investments that had been made and then to form a conclusion on the bona fides of those investments and also on -- in the context effectively of whether funds -- monies had been misappropriated, for example, by the (indiscernible).

And my work in that case was looking at the filings information of those companies, looking at valuation reports that were prepared on behalf of those companies,

looking at other documents relating to those companies, and then forming a considered conclusion on the basis of that information on both the recoverable amount of the investment, whether, indeed, the investments were bona fide. That report was provided in the context of those regulatory proceedings.

Q. And in that matter did you calculate an estimate of FVLCS under IAS 36?

A. I didn't do a formal calculation of it, no. But I would -- in considering the recoverable amount of those assets, I effectively applied what I first required because that is -- you know, I'm a chartered accountant.

Q. Is that matter ongoing?

A. No. That matter is not ongoing.

Q. Were you the instructive expert in that case or was one of your colleagues the instructive expert?

A. I was the instructive expert.

Q. And did you give expert -- did you give testimony in that case?

A. I didn't, no. That was -- it was

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regulated -- as I said earlier, it was regulated in the context of the suspension of the fund's license.

Q. So do you prepare a report in that case?

A. Yes, I did.

Q. And if you were to look at that report, would you be able to determine whether or not it involved a coal mining company?

A. I'm not entirely sure from the report. The purpose of the work that I did, it was -- the specific minerals was -- you know, is not particularly relevant. I could look at the underlying information.

Q. Well, how would you determine -- if you were -- how would you go about determining whether or not that matter involved a coal mining company?

A. How would I do that now?

Q. Yes.

A. I would go back to my working papers. I would go back to the information we received and have a look at it.

Q. And is that information available

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to you?

A. I would hope so.

Q. When did that matter conclude?

A. I'd need to check my notes but my best guess is that it was three years ago, maybe. Maybe slightly less. Maybe two and a half.

Q. Are there any other matters that you have in your mind that you think may have involved coal mining assets or coal mining companies?

A. The other mining related assignments that immediately are springing to mine are gold, copper, titanium. And then various other energy and oil and gas projects. I can't specifically think of another -- another coal mining case.

Q. Okay. So I just want to ask you a follow-up question about the appendices to your opening and rebuttal reports, the appendices that are entitled Information Relied Upon; so Appendix C to your opening report and Appendix A to your rebuttal report.

A. Okay.

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Q. So in Appendix B to your opening report you list five depositions that you reviewed.

Do you see that?

A. Yes. And as we talked about earlier today, these are depositions that are specifically cited in my report.

Q. And Appendix A to your rebuttal report lists three deposition transcripts, right?

A. Yes. Those are the depositions that I specifically cited in that report.

Q. Did you -- did you review any deposition transcripts that are not listed in Appendix C to your opening report or Appendix A to your rebuttal report?

MR. CONWAY: I think that was asked and answered.

MR. WU: Okay.

Q. Well, answer it again because I forgot.

MR. CONWAY: Okay.

A. Yes, I did. I believe I reviewed all of the depositions in this case. My

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understanding is that in the correspondence between the SEC and counsel for the defendants that was confirmed.

Q. I want to make sure I understand what you just testified, okay? You said, "I believe I reviewed all of the depositions in this case."

Do you believe that you've reviewed the deposition of all the fact witnesses in this case?

A. I don't know what I don't know, but that's my understanding.

Q. Let me just give you an example. Did you review the deposition transcript of Tareq Sholi?

MR. CONWAY: Who, Aric? Sorry.

Q. Tareq Sholi.

A. Yes. He was part of the accounting function. Is that right?

Q. I'm just asking if you reviewed the transcript.

And, for example, did you review the deposition transcript of Matt Colter?

A. Are you saying Colter?

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Q. Colter.

A. I would need to check on that one. It didn't specifically ring a bell. I have looked at a lot of depositions.

MR. WU: I guess, Dean, we can follow up but I guess we would ask that you produce a list of all the deposition transcripts that Mr. Drewe reviewed.

MR. CONWAY: Send a request and we'll look at it.

MR. WU: I'm making the request on the record right now.

MR. CONWAY: Okay. I understand. But send us something in writing and we'll take a look.

BY MR. WU:

Q. You're not testifying that you reviewed the deposition transcript of any other experts in this case, are you?

A. No, I haven't reviewed the deposition transcript of any expert.

Q. Have you formed any opinions about this matter that are not set forth in your opening report or your rebuttal report?

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A. I was initially instructed to consider the impairment test at 31 December 2011. That's not included in my report.

Q. Anything else?

A. No. Nothing else.

DI Q. And what opinion did you reach in terms of whether -- as to the impairment test of 31 December 2011?

MR. BEDNAR: Object to the extent that this is not an opinion that's expressed in his report. As you know, the Judge dismissed that claim from the SEC's Complaint.

MR. WU: Are you instructing him not to answer?

MR. BEDNAR: No, I'm not.

MR. CONWAY: Aric, The defendants specifically requested that that topic be excluded from discovery. There is a court order saying that that's not part of discovery. We are instructing him not to go outside the scope.

MR. WU: Okay. So just to be clear, you're instructing him not to

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answer?

MR. BEDNAR: I believe that the Court has issued an order so the Court has instructed that that's beyond the scope and we're instructing him not to answer.

MR. WU: Okay.

BY MR. WU:

Q. Are there any opinions expressed by defendants' experts that you disagree with that are not set forth in your opening report or rebuttal report?

MR. CONWAY: Asked and answered.

A. As we discussed earlier, and as I explain in my rebuttal report at paragraph 1.2.2, "For the avoidance of doubt, where I do not comment on aspects of the Rio Tinto expert reports in this report, this does not mean that I accept the positions set out within them."

Q. And you're not offering any opinions beyond what's contained in your opening report and your rebuttal report, correct?

MR. CONWAY: Are you asking about --

MR. WU: I didn't hear.

MR. CONWAY: Are you asking about his affirmative opinions that are contained in his report?

MR. WU: I'm asking him if he is offering any opinions in this case beyond what's contained in his opening report and his rebuttal report.

MR. CONWAY: Objection. Asked and answered.

A. In my rebuttal report I explained that I haven't commented on all aspects of the expert reports but that doesn't mean that I accept the positions set out within them. So --

Q. And I'm just asking whether you are offering any opinion in this case beyond what's contained in your opening report and your rebuttal report.

MR. CONWAY: Objection. Asked and answered several times.

A. I haven't offered any opinions in

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my rebuttal report beyond what's in my rebuttal report and my main report.

Q. I'm sorry. When you said -- I don't understand. You said you haven't offered any opinions in your rebuttal report beyond what's in your rebuttal report and your main report?

A. Yes. I believe your question was am I offering any opinion beyond what's in my rebuttal report and my --

Q. No, that's not my question. That's not my question. My question is are you offering any opinions beyond what is contained in, A, your opening report, and, B, your rebuttal report?

MR. CONWAY: Objection. Asked and answered that.

A. You mean am I offering those opinions today or -- I don't -- sorry. I'm not quite following the question.

Q. Well, you're holding yourself out as an expert in this case, right?

A. That's correct, yes.

Q. And you are -- and in that

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capacity you are offering opinions in this case, correct?

A. Yes. I've provided opinions in my main report and my rebuttal report.

Q. And are you offering any expert opinions in this case beyond what is contained in A, your opening report, and B, your rebuttal report?

MR. CONWAY: Objection. Asked and answered.

A. I mean, as I sit here today, the opinions that I've offered are in my report and my rebuttal report. I don't know where you're expecting me to have additional opinions.

Q. Mr. Drewe, after you submitted your rebuttal report in this case have you been asked to do any additional work?

A. Apart from preparing for this --

MR. CONWAY: Objection. Form.

And I would --

Q. It's a yes-or-no question. I'm not asking you to divulge -- you can answer the question. I think you were saying "Apart

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from preparing for this deposition," what?

MR. CONWAY: I just caution the witness do not divulge privileged communications between the SEC and himself.

A. Well, I was asked to prepare for this deposition.

Q. Outside of that, anything else?

A. Nothing I can recall.

Q. So earlier today we were discussing that prior to being engaged as a testifying expert in this case, you had performed some work for the SEC in connection with a consulting engagement with Mazars; is that correct?

A. Yes. That's correct.

Q. And that consulting engagement related to the SEC's pre-lawsuit investigation; is that correct?

A. Yes. That is correct.

Q. What were your instructions in the SEC investigation phase?

MR. CONWAY: Aric, again, to the extent your question calls for

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communications between the SEC and Mr. Drewe, I'd caution the witness not to divulge those communications.

Now, go ahead, Mr. Drewe.

A. The work that I did was in the investigation phase was in effect an extension of the work that I've done in my report. And it was the earlier phases of the work that I've done as set out in my report.

Q. So is it fair to say you've performed certain analyses as part of your investigation?

A. Yeah. I performed -- I've performed certain analyses. I would agree to that.

Q. And I just want a yes-or-no answer so you don't have to divulge any privileged information.

Did you draft any reports?

A. No.

Q. Did you construct any valuation model?

A. No.

Q. Did you adjust any Rio Tinto

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valuation models?

A. Not that I can specifically recall.

Q. Did you provide any work product to the SEC as part of your investigation assignment?

A. Could you just give me an example of what work product would include? Is it basically anything written?

Q. Yeah. Let's do it that way. Did you provide any written work product to the SEC as part of your investigation assignment?

A. I believe we did provide something, yes.

Q. And by "we" you mean you and Mr. Brice?

A. Yes, that's correct.

Q. And did you provide any analyses orally to any of the SEC attorneys as part of your investigation assignment?

A. Yes.

Q. And with whom did you speak at the SEC in connection with your SEC investigation assignment?

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THE WITNESS: Am I to answer that, Mr. Conway?

MR. CONWAY: Yes. You can answer that.

THE WITNESS: Thank you.

A. The individuals that we spoke to included Dean Conway, Gregory Miller. Thomas Bednar. Mark Cave.

Q. Were you provided documents -- or did the SEC provide you with documents as part of your investigation assignment?

A. Yes.

Q. Were you provided access to the 150,000-plus docs we've been talking about today as part of your investigation assignment?

A. No.

Q. Did you review any drafts of the SEC's Complaint in this lawsuit before it was filed on October 17, 2017?

A. No.

Q. Did you review any recommendation from the SEC enforcement staff to the Commission seeking authority to file this

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lawsuit?

A. Not that I can recall, no.

Q. Did you review any communications from the SEC enforcement staff to the SEC Commission?

A. Again, not that I can recall, no.

Q. Did you review any memo or draft memo containing the SEC enforcement staff's analysis of this matter?

MR. CONWAY: Objection, form. Vague.

A. No. Not that I can recall.

Q. During the course of the deposition, have you communicated by text or e-mail with anybody from Mazars working on this matter?

A. I've seen I've got a lot of e-mails because they keep popping up, but I haven't sent one e-mail.

Q. And same answer for texts?

A. My wife works at Mazars. I sent her a text, but not to do with the case.

Q. Excluding break times, during the course of this deposition have you talked to

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or e-mailed anybody from the SEC?

A. No.

MR. WU: Can we go off the record.

THE VIDEOGRAPHER: The time is 10:37. We are going off the record.

(Recess taken.)

THE VIDEOGRAPHER: The time is 10:46. We are back on the record.

MR. WU: Mr. Drewe, I don't have any further questions at this time. But I'm reserving the balance of my time for possible further questioning depending on whether the SEC has some questions. Thank you.

MR. CONWAY: Do any of the other defendants have questions, Aric?

MR. WU: No.

MR. FLETCHER: This is Scott Fletcher, counsel for Thomas Albanese. Subject to receipt of a complete materials considered list, we don't have any questions at this time.

MR. RICCIARDI: This is Walter Ricciardi for Guy Elliott. We have no

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questions at this time. Thank you.

MR. CONWAY: Okay. So why don't you give us -- let's go off the record for a moment. We'll take a ten-minute break and reconvene.

THE VIDEOGRAPHER: The time is 10:46. We're going off the record.

(Recess taken.)

THE VIDEOGRAPHER: The time is 10:57. We are back on the record.

MR. CONWAY: Mr. Drewe, the SEC doesn't have any questions at this time. We appreciate your time today and have a good evening.

MR. WU: Mr. Drewe, thank you as well. I appreciate your time. I know it's really late in London. Please get home safely. Appreciate it.

(Continued on next page to include jurat.)

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THE WITNESS: Thank you.

MR. RICCIARDI: Thank you very much and everybody take care.

THE VIDEOGRAPHER: The time is 10:58. That marks the end of today's deposition. We're going off the record.

(Time Noted: 10:58 p.m.)

____

CHRISTOPHER DREWE

Subscribed and sworn to before me

this ___ day of __________, 2020.

____

Notary Public

C E R T I F I C A T E

STATE OF NEW YORK)
: ss.
COUNTY OF NEW YORK)

I, FRANCIS X. FREDERICK, a Notary Public within and for the State of New York, do hereby certify:

That CHRISTOPHER DREWE, the witness whose deposition is hereinbefore set forth, was duly sworn by me and that such deposition is a true record of the testimony given by the witness.

I further certify that I am not related to any of the parties to this action by blood or marriage, and that I am in no way interested in the outcome of this matter.

IN WITNESS WHEREOF, I have hereunto set my hand this 7th day of July, 2020.

FRANCIS X. FREDERICK

----------------- I N D E X ------------------

----------- INFORMATION REQUESTS -------------

DIRECTIONS: 65, 66, 76, 275

RULINGS: NONE

TO BE FURNISHED: NONE

REQUESTS: NONE

MOTIONS: NONE

------------------ EXHIBITS ------------------

------------------ EXHIBITS ------------------

------------------ EXHIBITS ------------------

NAME OF CASE:

DATE OF DEPOSITION:

NAME OF WITNESS:

Reason Codes:

1. To clarify the record.

2. To conform to the facts.

3. To correct transcription errors.

Page ______ Line ______ Reason ______

From ____________________ to ____________________

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EXHIBIT 4

Secretariat

Securities and Exchange Commission
Plaintiff

v.

Rio Tinto Plc, Rio Tinto Limited, Thomas Albanese, and Guy Robert Elliott
Defendants

Expert Report of Chris Milburn, CPA, CMA, CBV

December 20, 2019

DEPOSITION
EXHIBIT
SEC 930

TABLE OF CONTENTS

SECTIONS

1. INTRODUCTION

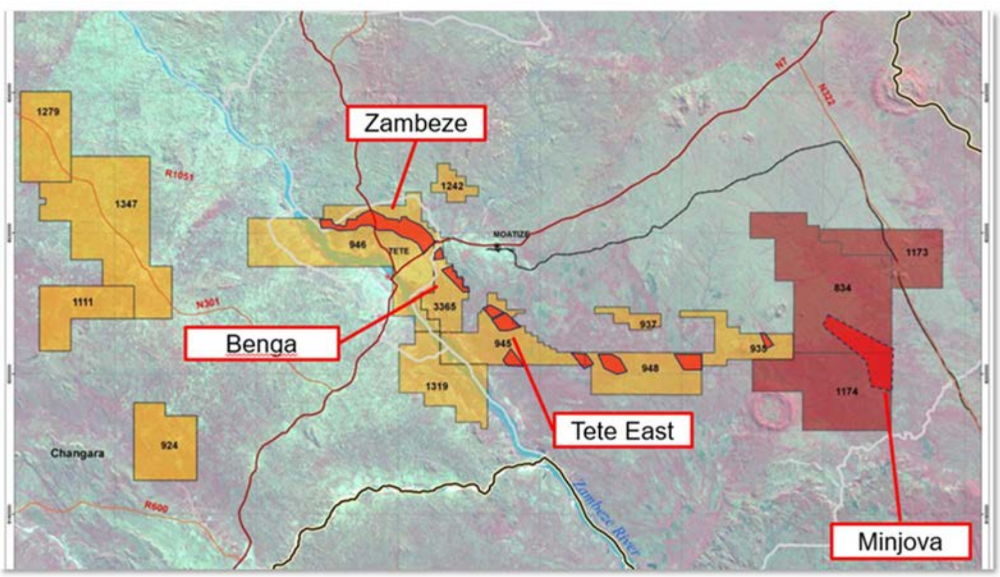
A. Assignment

1.1 I have been retained by the Securities and Exchange Commission ("**SEC**") to provide my independent and objective comments and expert opinions on valuation issues in connection with the litigation between the SEC ("**Plaintiff**") and Rio Tinto PLC, Rio Tinto Limited, Thomas Albanese and Guy Robert Elliot (collectively the "**Defendants"**).

1.2 I am instructed that the litigation between the parties relates to allegations by the Plaintiff of fraud by the Defendants with respect to the public disclosure and financial reporting following the acquisition of Riversdale Mining Limited ("**Riversdale**") by Rio Tinto PLC and Rio Tinto Limited (collectively "**Rio Tinto**") on April 8, 2011 (the "**Acquisition Date**").[1]

1.3 Following the Acquisition Date, Riversdale was delisted and renamed Rio Tinto Coal Mozambique ("**RTCM**"). At this time RTCM held three main mineral properties, all located in Mozambique: Benga, Zambeze and Tete East.[2,3] In 2011, Rio Tinto acquired an additional coal property in Mozambique, called Minjova, which it considered in some of its valuation models as part of RTCM's group of properties. I refer to these four properties collectively as the "**RTCM Projects**".

Figure 1.1: Map of the RTCM Projects[4]



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1 SEC Complaint dated October 17, 2017 (the "**SEC Complaint**"), paragraph 1.

2 Rio Tinto Technology and Innovation, Project Ralph Technical Due Diligence, dated January 7, 2011, page ii. [RT_00350519]

3 At the time of the acquisition, the Riversdale assets also included the Zululand Anthracite Colliery (ZAC), a smaller producing property in South Africa. Rio Tinto did not include this asset in the Mozambique assets of RTCM, as it intended to sell the ZAC asset after the acquisition of Riversdale. Source: Rio Tinto Controller's Paper dated June 18, 2012, page 9. [RT_00000240]

4 Rio Tinto Coal Mozambique, "Business Review", dated May 2012", page 6. [RT_00241218]

1.4 I have been asked to provide the following:

i) A discussion of valuation practices, approaches and international standards and guidelines specific to the valuation of mineral projects;

ii) A summary of Rio Tinto's DCF valuation models for the RTCM Projects from the Acquisition Date to November 2012 and a comparison of the financial model prepared by Rio Tinto for the purposes of the acquisition of Riversdale (the "**Acquisition Model**") and the financial model prepared by RTCM in 2012 (the "**Business Unit Model**");

iii) I have been asked to address and render opinions on the following issues:

1) Assuming it was determined as of late 2011 that transporting coal via barges on the Zambeze River was not a viable option for RTCM, did the Acquisition Model provide a reliable measure of the fair market value[5] of the RTCM Projects at that time?

2) Assuming it was determined as of mid-2012 that transporting coal via barges on the Zambeze River was not a viable option for RTCM, did the Acquisition Model provide a reliable measure of the fair market value of the RTCM Projects at that time?

B. Source of Information

1.5 In the preparation of this report I have relied upon the documents listed in Appendix 1 of this report.

C. Qualifications

1.6 I am a professional accountant (CPA, CMA) and a Chartered Business Valuator (CBV). I am a Managing Director with Secretariat International and have been involved exclusively in business valuations, financial litigation, and corporate finance-related matters since 1997. I have acted as an advisor to private and public companies, regulatory bodies, and governments on a wide variety of industries. My work experience covers assignments throughout the world.

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5 For the purposes of my discussion, I refer to the value term Fair Market Value ("**FMV**") which is defined as, "*"[T]he price, expressed in terms of cash equivalents, at which property would change hands between a hypothetical willing and able buyer and a hypothetical willing and able seller, acting at arms-length in an open and unrestricted market, when neither is under compulsion to buy or sell and when both have reasonable knowledge of the relevant facts." Source:* CICBV, "Practice Bulletin No. 2 – International Glossary of Business Valuation Terms", 2001, page 5. [SI-1]

1.7 I have extensive experience in the valuation and quantification of damages relating to mineral projects across all stages of development and involving mining projects located all over the world with mineralization including coal, gold, silver, platinum, palladium, copper, cobalt, zinc, lead, molybdenum, nickel, indium, gallium, lithium, tantalum, phosphate, potash, and iron ore. I am a Qualified Valuator under the Standards and Guidelines for Valuation of Mineral Properties promulgated by the Canadian Institute of Mining's Valuation Committee ("**CIMVAL**").

1.8 I have experience in the valuation of mineral projects located in Africa, North America, South America, Central America, Australia, Asia and Europe, with reference to mineral valuation codes for Australia, the United States, South Africa, and Canada.

1.9 I have prepared expert opinion reports on valuation and economic damages issues in disputes before Canadian and US domestic courts, commercial arbitrations and investor-state arbitrations under many forums including the International Centre for the Settlement of Investment Disputes (ICSID), Permanent Court of Arbitration (PCA), International Chamber of Commerce (ICC), and the London Court of International Arbitration (LCIA).

1.10 I have provided expert testimony relating to the valuation of mineral projects on several occasions.

1.11 I am the primary author of this report and although I was assisted by Secretariat International staff in its preparation, I am responsible for its contents in its entirety.

1.12 My curriculum vitae is attached hereto as Appendix 2.

D. Preparation and use of this report

1.13 As I am a member in good standing of the Canadian Institute of Chartered Business Valuators ("**CBV Institute**"), I have prepared this report to conform with the Practice Standards of the CBV Institute.

1.14 The relevant Practice Standards of the CBV Institute include those governing the preparation of Expert Reports (CICBV Practice Standards 310, 320, and 330).[6]

1.15 This report has been prepared solely for the purpose described in this introduction. In all other respects, this report is confidential. It should not be used by any other party for any purpose or reproduced or circulated, in whole or in part, by any party without the prior written consent of Secretariat.

1.16 My hourly rate for this assignment is $750/hour[7] and the hourly rates of the Secretariat staff that assisted me in this assignment ranged from $400 to $500 per hour. My compensation for my work on this assignment is based on the number of hours worked and expenses incurred, and is not contingent on the outcome of the litigation.

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6 The CICBV standards are split into three sections with "10" being reporting standards and recommendations, "20" being scope of work standards and recommendations, and "30" being file documentation standards. All the standards are available at www.cicbv.ca/practice-standards/.

7 For the purpose of this report, all $ amounts are expressed in U.S. dollars, unless otherwise noted.

2. INDUSTRY OVERVIEW

A. Introduction

2.1 In this section, I provide an overview of coal, the mining industry generally and the global coal mining industry in 2011 to 2012.

B. The Mining Industry

2.2 Companies in the mining industry are engaged in the extraction and processing of minerals from the earth. Minerals extracted in the mining process are essential for maintaining and improving the standard of living across the world. Mined materials are needed to construct roads and buildings, to build automobiles, to make computers and satellites, to generate electricity, and to provide the many other goods and services that consumers require.

2.3 There are three primary methods used to extract minerals:[8]

i) Underground mining: ores that are located deep under the Earth's surface or that lie well below the surface, are mined using underground mining;

ii) Open pit or surface mining: ores located closer to the surface can be mined using surface mining methods, which generally cost less than underground methods; and,

iii) Placer mining: used to recover minerals from sediments in river channels, beach sands, or ancient stream deposits; in placer operations, the mined material is washed and sluiced to concentrate the heavier minerals.

2.4 The life cycle of a mine includes the following stages:[9]

i) Expansion: the first stage in the mining asset life cycle involves risk and geological assessment, and includes the search for evidence of mineral ores or other valuable minerals (coal or non-metallic minerals) to target for further exploration through surveying, sampling and observation of mineral outcroppings;

ii) Exploration: the second stage in the life of a mine is where the physical properties of a mineral deposit are assessed through drilling, trenching and other geological techniques and the preparation of technical studies. Once the technical aspects of the deposit are known with a high level of certainty, economic considerations can be applied to determine whether or not it will be economic to extract, process and sell the finished product in markets around the world;

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8 US Geological Survey, "How do we extract minerals?". [SI-2]
9 "Introductory Mining Engineering", Hartman, H. L., & Mutmansky, J. M., dated 2002, pages 6 to 14. [SI-3]

iii) Evaluation: the third stage involves the preparation of technical reports, including Resource Reports, Preliminary Economic Assessments, and Pre-Feasibility Studies, to assess whether the mining project should advance to development;

iv) Development: the fourth stage involves the financing and construction of the mine and the surrounding infrastructure required to mine, process and transport the saleable mineral products to market. At this stage, a bankable Feasibility Study is prepared, and licenses and permit applications are made;

v) Production: the fifth stage is the extraction of minerals from the earth, and the processing of the minerals into saleable products. While exploration and development typically continue during this stage in order to extend the mine life, the emphasis in this stage is on production to generate positive cashflow for the mine owner; and,

vi) Closure: the final stage of a mine's life is reclamation and remediation. This process involves the closing of the mine and recontouring and revegetating the land and restoring local ecosystems to their original state.

C. Coal and Types of Coal

2.5 Coal plays a vital role in meeting global energy needs and is critical to infrastructure development. It is used in electricity generation, steel production, cement manufacturing and as a liquid fuel.[10]

2.6 Coal is a sedimentary rock made predominately of carbon. It is formed from plant remains (peat) that have been compacted, hardened, chemically altered, and metamorphosed by heat and pressure over time. The degree of change undergone by coal is known as "coalification".[11] Figure 2.2 below provides an illustration of the coalification process.

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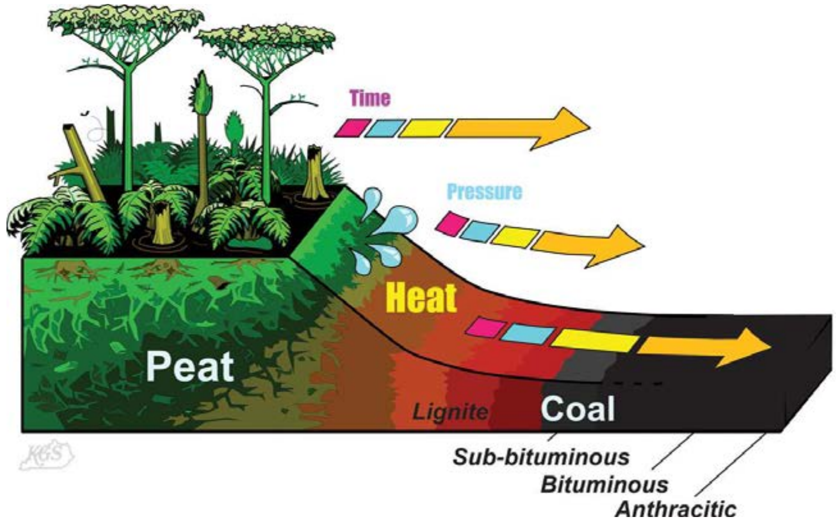
10 World Coal Association, Uses of Coal. [SI-4]
11 World Coal Association, What is Coal. [SI-5]

Figure 2.2: The Coalification Process[12]



2.7 A major factor in determining coal quality is coal rank. According to the U.S. Geological Survey ("**USGS**"), there are four major ranks of coal. The rank refers to its level in the process of coalification. The four ranks are as follows:[13]

i) Anthracite: The highest rank of coal. It is a hard, brittle, and black lustrous coal, often referred to as hard coal, containing a high percentage of fixed carbon and a low percentage of volatile matter;

ii) Bituminous: Bituminous coal is a middle rank coal between subbituminous and anthracite. Bituminous coal typically has a high heating value, measured in British Thermal Units, or Btu. This coal type has a shiny and smooth appearance, and is commonly used in electricity generation and the iron/steel production processes;

iii) Subbituminous: Subbituminous coal is black in colour and dull and has a higher heating value than lignite; and,

iv) Lignite: Lignite coal, also known as brown coal, is the lowest grade of coal with the least concentration of carbon.

2.8 The four ranks of coal above can be split into two categories: low rank (or soft) coal and hard coal. Low rank coal includes lignite and subbituminous coal, whereas hard coal consists of bituminous and anthracite coal.[14]

2.9 Coal is a family of different products with classifications that refer to a range of ages, compositions and properties.[15] Coal rank is usually assessed by a series of tests that determine the calorific value, moisture content, volatile matter content, ash content, and fixed-carbon content.

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12 Kentucky Geological Survey, Coalification [SI-6]
13 US Geological Survey, What are the types of coal? [SI-7]
14 World Coal Association, Types of Coal. [SI-8]
15 International Energy Agency, Coal Medium-Term Market Report, 2012, page 16. [SI-9]

i) The Calorific Value or Heating Value of coal indicates the amount of heat and energy, expressed in Btu per pound, that is released when the coal is burned.[16] As a general rule, the harder the coal, the higher its energy value and rank.

ii) Moisture content is an important parameter in coal analysis as it impacts the calorific value and handling properties of a coal. A change in the moisture content changes the proportion of the other coal constituents and the calorific value. In general, as moisture content increases the rank decreases.[17]

iii) Volatile matter is material that is driven off when coal is heated to 950 °C (1,742 °F) in the absence of air under specified conditions. It is measured by determining the loss of weight, and consists of a mixture of gases, organic compounds, and tars. As volatile matter increases, rank decreases.[18]

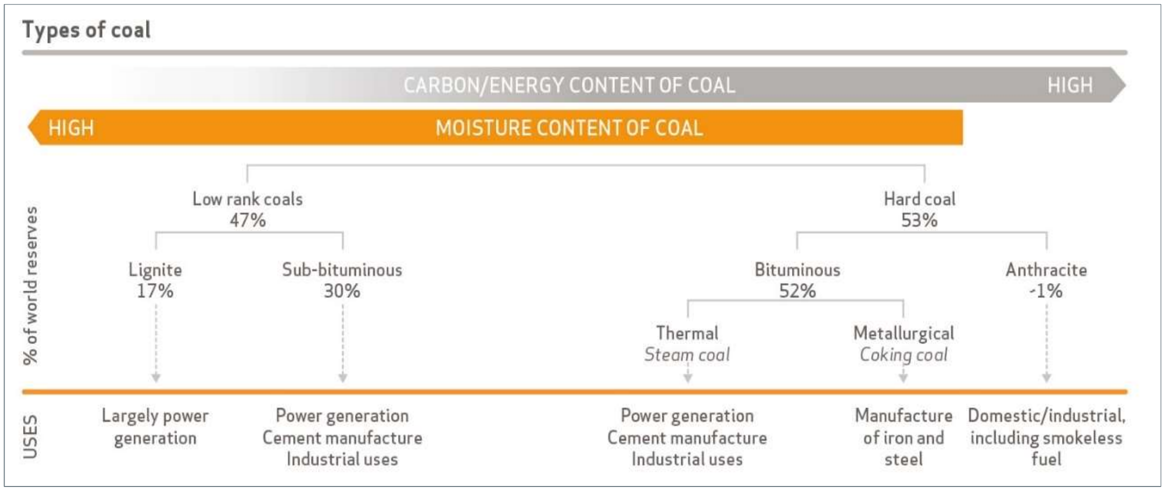
iv) Coal contains a variety of minerals in varying proportions that, when the coal is burned, are transformed into ash. Ash is the non-combustible residue formed from the inorganic or mineral components of the coal. Increasing ash yield corresponds to lower heating (calorific) value, and therefore lower rank.[19]

v) The fixed-carbon content is the solid combustible residue that remains after subtracting the percentages of moisture, volatile matter, and ash from a coal sample. It is a calculated value determined from other parameters measured in a proximate analysis, rather than through direct measurement. As fixed-carbon content increases, rank increases.[20]

16 Kentucky Geological Survey, Calorific Value. [SI-10]
17 Kentucky Geological Survey, Moisture in Coal. [SI-11]
18 Kentucky Geological Survey, Volatile Matter. [SI-12]
19 Kentucky Geological Survey, Ash. [SI-13]
20 Kentucky Geological Survey, Fixed Carbon. [SI-14]

2.10 The following figure provides an illustration of the types of coal, classified by the energy content and moisture content of the coal, as well as their frequency of occurrence and their main uses:

Figure 2.3: Types of Coal[21]



2.11 Coal grade is an economic or technological classification of the relative quality of a coal for a particular use. A variety of grades of coal are defined for different uses or markets in different industries and countries, and for the needs of a particular process or by regulations concerning the process or end-use product.[22] As noted in the figure above, bituminous coal includes two different coal grades: metallurgical or 'coking' coal and thermal coal or 'steam' coal. While they have similar geologic origins, their commercial markets and industrial uses are vastly different:

i) Metallurgical coal is also commonly referred to as coking coal.[23] Coking coal has physical properties that when heated cause it to soften, liquefy and then re-solidify into a harder substance known as coke.[24] Coke is a porous, hard black rock of concentrated carbon that is created by heating bituminous coal without air to extremely high temperatures. Hard coking coal is a key ingredient for the production of iron and steel.[25]

ii) Thermal coal, also known as steam coal, is a grade of coal used in electric power plants to generate steam to create electricity. It is ground into a fine powder that burns quickly at high temperatures and is used in power plants to heat water in boilers that run steam turbines used to generate electric power. It may also be used to provide space heating for homes and businesses.[26]

21 World Coal Association, Types of Coal. [SI-8]
22 Kentucky Geological Survey, Steam Coal. [SI-15]
23 I refer to this type of coal as coking coal in this report.
24 Ram River Coal Corp. "Metallurgical Coals", page 3. [SI-16]
25 Ram River Coal Corp. "Metallurgical Coals", page 9. [SI-16]
26 World Coal Association, Coal Electricity. [SI-17]

D. Coal Mining

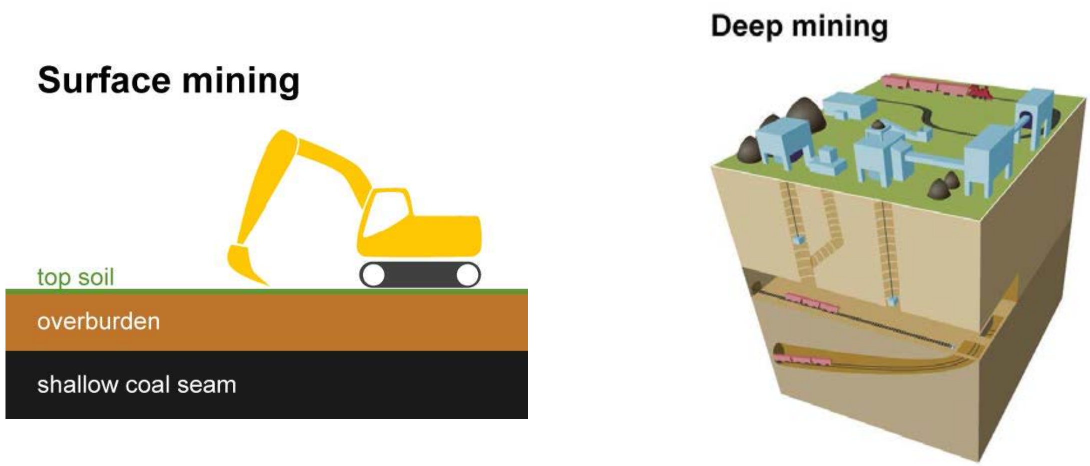
2.12 Coal is mined by either surface mining or underground mining.[27]

2.13 In surface mining, large machines remove the topsoil and layers of rock known as overburden, or waste rock, to expose the coal seam. Surface mining is often used when coal is less than 200 feet underground and is generally less expensive for extracting coal than underground mining.[28]

2.14 Underground mining is necessary when the coal is located several hundred feet below the earth's surface. Miners travel by elevator down a mine shaft to reach the depths of the mine, and travel on small trains in long tunnels to get to the coal deposits. The miners operate large machines to dig out the coal.[29]

2.15 Surface and underground mining are illustrated below:

Figure 2.4: Coal Surface Mining and Underground Mining[30]



2.16 After removing the coal from the ground, the coal is sent to a preparation plant near the mining site. Coal preparation cleans and processes coal to remove rocks, dirt, ash, sulphur, and other unwanted materials. This process ensures consistent coal quality and upgrades the coal value.[31]

2.17 Once it has been prepared, the coal is shipped to market. There are several methods for transporting prepared coal from the mine to the markets for sale:[32]

i) Conveyors, trams, and trucks move coal around mines, short distances from mines to consumers close to the mines, or to other modes of long-distance transportation;

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27 World Coal Association, Coal Mining. [SI-18]
28 U.S. Energy Information Administration (EIA), Coal Mining and Transportation. [SI-19]
29 U.S. Energy Information Administration (EIA), Coal Mining and Transportation. [SI-19]
30 U.S. Energy Information Administration (EIA), Coal Mining and Transportation. [SI-19]
31 U.S. Energy Information Administration (EIA), Coal Mining and Transportation. [SI-19]
32 U.S. Energy Information Administration (EIA), Coal Mining and Transportation. [SI-19]

ii) Trains transport coal deliveries from short to long distances;

iii) Barges transport coal short to medium distances on rivers and lakes;

iv) Ships transport coal medium to large distances over lakes and oceans; and,

v) Slurry pipelines move mixtures of crushed coal and water.

E. Global Coal Industry in 2011 and 2012

Global Coal Market

2.18 Coal resources and reserves have been reported in almost every country of the world, with recoverable reserves reported in approximately 70 countries.[33]

2.19 As of 2012, there were an estimated 1.1 trillion tonnes of proven coal reserves worldwide, which is enough coal reserves to last around 150 years at current rates of production. In contrast, there were approximately 50 years of proven oil and gas reserves at current production levels.[34]

2.20 Coal was the largest growing source of primary energy in 2011 and 2012, with incremental consumption over 50% higher than oil and gas incremental demand combined.[35] Consequently, coal strengthened its position as the second most important source of primary energy behind oil.[36] Approximately 30% of global primary energy needs, 42% of the world's electricity[37] and 68% of the world's steel[38] was produced using coal as of 2011.

Global Coal Demand

2.21 In 2011, global coal demand increased by 4% (2010: 7,080 million tonnes ("**Mt**"); 2011: 7,384 Mt).[39] This growth rate was consistent with the average growth for the preceding ten years (4%).[40] Incremental thermal coal demand was 176 Mt in 2011, increasing by 3% (2010: 5,293 Mt; 2011: 5,469 Mt); whereas metallurgical coal demand grew by 8% (2010: 812 Mt; 2011: 878 Mt).[41]

2.22 In 2012, global coal demand increased by 2%.[42] Although coal demand increased, demand growth was the third lowest on record over the preceding decade.[43] The growth rate for global hard coal consumption was 3%, Demand for thermal coal and coking coal was 2% and 4%, respectively (lower than that of 2011).

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33 World Coal Association, Where is Coal found. [SI-20]
34 World Coal Association, Where is Coal found. [SI-20]
35 International Energy Agency, Coal Medium-Term Market Report, 2012, page 12. [SI-9]
36 International Energy Agency, Coal Medium-Term Market Report, 2012, page 12. [SI-9]
37 World Coal Association, Coal Facts, 2012, page 1. [SI-21]
38 World Coal Association, Coal & Steel Facts, 2012, page 1. [SI-22]
39 International Energy Agency, Coal Medium-Term Market Report, 2012, page 12. [SI-9]
40 International Energy Agency, Coal Medium-Term Market Report, 2012, page 15. [SI-9]
41 International Energy Agency, Coal Medium-Term Market Report, 2012, page 12. [SI-9]
42 International Energy Agency, Coal Medium-Term Market Report, 2013, page 14. [SI-23]
43 International Energy Agency, Coal Medium-Term Market Report, 2013, page 14. [SI-23]

Global Coal Supply

2.23 Global coal supply grew by 7% in 2011 (2010: 7,201 Mt; 2011: 7,678 Mt), which compares with an average of only 5% over the first decade of the 21st century.[44]

2.24 In 2012, global coal production growth began to slow and global coal supply grew by only 2% which is significantly lower than the 5% average of the preceding decade.[45] Incremental thermal coal supply contributed to approximately 84% of total hard coal supply growth, with coking coal accounting for the remaining 16%.[46]

International Market

2.25 The market for internationally traded coal grew by 7%, or 77 Mt in 2011.[47] Over 90% of coal trade in 2011 was seaborne hard coal with the remainder being overland coal trade.[48]

2.26 China is by far the world's largest producer and consumer of coal, and accounts for more than 45% of both global totals.[49] In 2011, China alone accounted for more than 75% of total incremental coal demand and became the world's largest importer of hard coal, taking over the position from Japan.[50] Chinese coal demand growth slowed from 9% in 2011 to 5% in 2012.

44 International Energy Agency, Coal Medium-Term Market Report, 2012, page 15. [SI-9]
45 International Energy Agency, Coal Medium-Term Market Report, 2013, page 26. [SI-23]
46 International Energy Agency, Coal Medium-Term Market Report, 2012, page 15. [SI-9]
47 International Energy Agency, Coal Medium-Term Market Report, 2012, page 33. [SI-9]
48 International Energy Agency, Coal Medium-Term Market Report, 2012, page 33. [SI-9]
49 International Energy Agency, Coal Medium-Term Market Report, 2012, page 12. [SI-9]
50 International Energy Agency, Coal Medium-Term Market Report, 2012, page 12. [SI-9]

3. THE VALUATION OF MINERAL PROJECTS

A. Introduction

3.1 The practice of valuation can be defined as *"the act or process of determining the value of something"*.[51]

3.2 The term "value" has many meanings in different contexts. Generally, the value of an item refers to its monetary worth or the "*fair return or equivalent in terms of money or goods and services for something exchanged.*"[52]

3.3 Whereas the amount a person would be willing to pay for a certain asset such as a piece of art may be driven largely by their perception or value, or by aesthetic or emotional reasons, the value of financial or business assets are driven by the cash flows that they are expected to generate in future. Thus, the practice of business valuation is primarily concerned with assessing the amount of future cash flow an asset or business is expected to generate in the future, and the risk or uncertainty of realizing those cash flows.[53]

3.4 The valuation of mineral projects is a specialty area of valuation that must be carried out by appropriately qualified individuals. In addition to having training and experience in general valuation principles and practices, a mineral property valuator must understand the mining industry and have experience with the valuation of mineral projects.

B. International Mineral Reporting Standards and the JORC Code

3.5 The Committee for Mineral Reserves International Reporting Standards ("**CRIRSCO**"), was formed in 1994 under the auspices of the Council of Mining and Metallurgical Institutes. CRIRSCO is a grouping of representatives of organizations that are responsible for developing mineral reporting codes and guidelines in the world's major mining centers including Australasia (JORC), Brazil (CBRR), Canada (CIM), Chile (National Committee), Colombia (CCRR), Europe (PERC), Indonesia (KOMPERS), Kazakhstan (KAZRC), Mongolia (MPIGM), Russia (NAEN), South Africa (SAMREC), Turkey (UMREK) and the USA (SME).[54]

3.6 Riversdale and Rio Tinto reported their coal ore mineral Reserves and Resources (defined below) in accordance with the Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves, December 2012 (the "**JORC Code**") as required by the Australian Securities Exchange (ASX).[55]

51 "Business Valuation", Howard E Johnson, page xlix. [SI-24]
52 Merriam-Webster dictionary, "Value". [SI-25]
53 "Damodaran on Valuation" 2nd Edition, Aswath Damodaran, page 1. [SI-26]
54 "CRIRSCO", Canadian Institute of Mining, Metallurgy and Petroleum. [SI-27]
55 Rio Tinto, 2012 Annual Report, Page 156. [SI-28]

3.7 The JORC Code is a mandatory professional code of practice that sets minimum standards for the public reporting of minerals exploration results, mineral resources and mineral reserves for listing companies in Australia and New Zealand.[56] Public reports prepared in accordance with the JORC Code inform investors or potential investors and their advisors and include annual and quarterly company reports, press releases, information memoranda, technical papers, website postings and public presentations of Exploration Results, Mineral Resources and Ore Reserves estimates.[57]

3.8 JORC reports must be prepared by a Competent Person ("**CP**"), a mineral industry professional who is a Member or Fellow of The Australasian Institute of Mining and Metallurgy, or of the Australian Institute of Geoscientists with a minimum of five years relevant experience in the style of mineralisation or type of deposit under consideration.[58]

3.9 The JORC Code envisages the use of reasonable investment assumptions, including the use of projected long-term commodity prices, in calculating mineral reserve estimates (see mining term definitions below). However, for US reporting, the US SEC requires historical price data to be used. For this reason, Reserves reported to the SEC in the Form 20-F may differ from those reported in accordance with the JORC Code.[59]

3.10 The JORC Code classifies mineral deposits by the level of geological and economic certainty (and thus value), as either Mineral Resources or Ore Reserves.

3.11 A **Mineral Resource** is defined by the JORC Code as follows:[60]

> *... a concentration or occurrence of solid material of economic interest in or on the Earth's crust in such form, grade (or quality), and quantity that there are reasonable prospects for eventual economic extraction. The location, quantity, grade (or quality), continuity and other geological characteristics of a Mineral Resource are known, estimated or interpreted from specific geological evidence and knowledge, including sampling...*

56 JORC Code 2012, [SI-29]
57 JORC Code 2012, paragraph 6. [SI-29]
58 JORC Code 2012, paragraph 11. [SI-29]
59 Rio Tinto, 2018 Annual Report, Page 270. [SI-30]
60 JORC Code 2012, paragraph 20. [SI-29]

3.12 Mineral Resources are divided into three categories under the JORC Code in order of increasing level of geological certainty as Inferred (lowest), Indicated and Measured (highest) Resources. JORC defines each as follows (emphases added):[61]

> *"An **Inferred Mineral Resource** is that part of a Mineral Resource for which quantity and grade (or quality) are estimated on the basis of limited geological evidence and sampling…An Inferred Mineral Resource has a lower level of confidence than that applying to an Indicated Mineral Resource and must not be converted to an Ore Reserve...Caution should be exercised if Inferred Mineral Resources are used to support technical and economic studies such as Scoping Studies.*
>
> *An **Indicated Mineral Resource** is that part of a Mineral Resource for which quantity, grade (or quality), densities, shape and physical characteristics are estimated with sufficient confidence to allow the application of Modifying Factors in sufficient detail to support mine planning and evaluation of the economic viability of the deposit…An Indicated Mineral Resource has a lower level of confidence than that applying to a Measured Mineral Resource, but has a higher level of confidence than that applying to an Inferred Mineral Resource.*
>
> *A **Measured Mineral Resource** is that part of a Mineral Resource for which quantity, grade (or quality), densities, shape, and physical characteristics are estimated with confidence sufficient to allow the application of Modifying Factors to support detailed mine planning and final evaluation of the economic viability of the deposit…A Measured Mineral Resource has a higher level of confidence than that applying to either an Indicated Mineral Resource or an Inferred Mineral Resource. It may be converted to a **Proved Ore Reserve** or under certain circumstances to a **Probable Ore Reserve**."* [emphasis added]

3.13 Indicated and Measured Mineral Resources can be upgraded to Ore Reserves which are economically mineable Mineral Resources, through the application of "Modifying Factors". JORC defines an Ore Reserve as follows:[62]

> *"…the economically mineable part of a Measured and/or Indicated Mineral Resource. It includes diluting materials and allowances for losses, which may occur when the material is mined or extracted and is defined by studies at Pre-Feasibility or Feasibility level as appropriate that include application of Modifying Factors. Such studies demonstrate that, at the time of reporting, extraction could reasonably be justified… Ore Reserves are sub-divided in order of increasing confidence into <u>Probable Ore Reserves</u> and <u>Proved Ore Reserves</u>"* [emphasis added]

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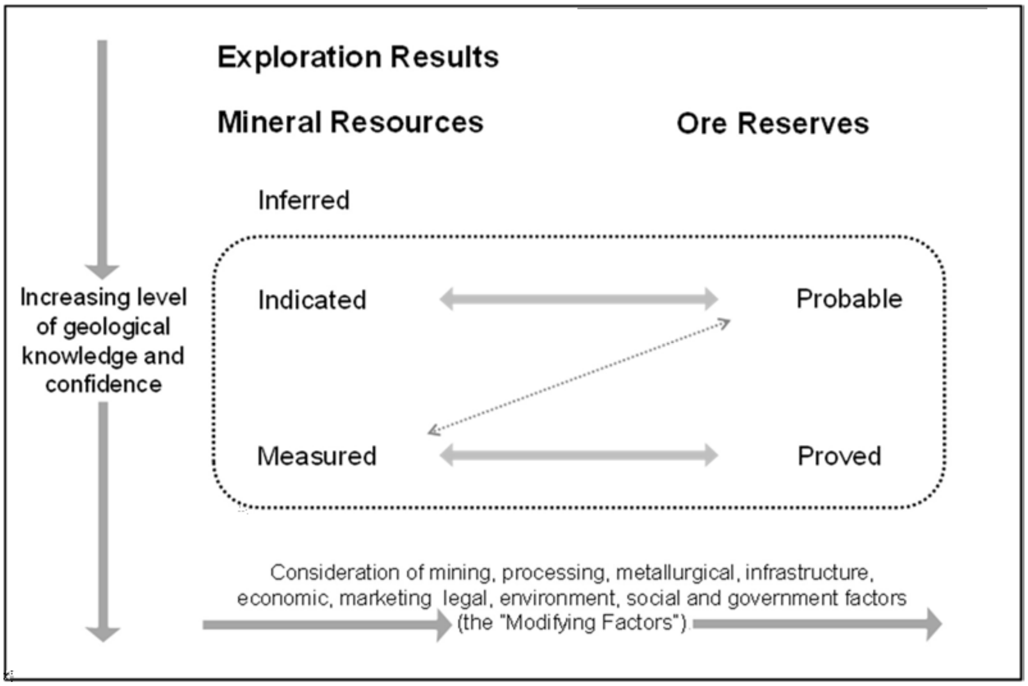
61 JORC Code 2012, paragraph 22. [SI-29]
62 JORC Code 2012, paragraph 22. [SI-29]

3.14 The following figure illustrates the gradient of definitions for Reserves and Resources under the JORC Code:

Figure 3.1: Reserves and Resources[63]



3.15 The "Modifying Factors" applied to convert Indicated and Measured Mineral Resources to Ore Reserves include mining, processing, metallurgy, infrastructure, economics (grade, price, costs to mine, process, ship), marketing, legal, environmental, social and governmental factors.[64] As noted in the figure above, Inferred Resources cannot be converted into Reserves and rather must be elevated into Indicated or Measured first. Indicated Resources can only be converted into Probable Reserves, but Measured Resources can be converted into either Probable or Proven Reserves.

63 JORC Code 2012, paragraph 12. [SI-29]
64 JORC Code 2012, paragraph 12. [SI-29]

3.16 Reserves and Resources under the JORC Code are defined by means of the following types of technical studies that are prepared by the Competent Persons (CPs):

i) A **Scoping Study:** "*is an order of magnitude technical and economic study of the potential viability of Mineral Resources. It includes appropriate assessments of realistically assumed Modifying Factors together with any other relevant operational factors that are necessary to demonstrate at the time of reporting that progress to a Pre-Feasibility Study can be reasonably justified. A Scoping Study must not be used as the basis for estimation of Ore Reserves.*"[65]

ii) A Preliminary Feasibility Study, also known as a **Pre-Feasibility Study** or ("**PFS**"), is "*a comprehensive study of a range of options for the technical and economic viability of a mineral project that has advanced to a stage where a preferred mining method is established and an effective method of mineral processing is determined. It includes a financial analysis based on reasonable assumptions on the Modifying Factors and the evaluation of any other relevant factors which are sufficient for a Competent Person, acting reasonably, to determine if all or part of the Mineral Resources may be converted to an Ore Reserve at the time of reporting.*"[66]

iii) A **Feasibility Study** ("**FS"**) is "*a comprehensive technical and economic study of the selected development option for a mineral project that includes appropriately detailed assessments of applicable Modifying Factors together with any other relevant operational factors and detailed financial analysis that are necessary to demonstrate at the time of reporting that extraction is reasonably justified (economically mineable). The confidence level of the study will be higher than that of a Pre-Feasibility Study*".[67]

3.17 In order to define an Ore Reserve, the JORC Code requires that at least a Pre-Feasibility Study be carried out with a mine plan that is technically achievable and economically viable, and that material Modifying Factors have been considered.[68]

C. International Mineral Valuation Standards

3.18 In additional to general valuation principles and standards, the valuation of mineral projects is guided by international mining codes which set out industry best practices for this area. The internationally recognized mining codes and standards include the following:

i) The Standards and Guidelines for Valuation of Mineral Properties prepared by the Special Committee of the Canadian Institute of Mining, Metallurgy and Petroleum ("**CIMVAL**");[69]

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65 JORC Code 2012, paragraph 38. [SI-29]
66 JORC Code 2012, paragraph 39. [SI-29]
67 JORC Code 2012, paragraph 40. [SI-29]
68 JORC Code 2012, paragraph 40. [SI-29]
69 CIMVAL Code. [SI-31]

ii) The South African Mineral Asset Valuation ("**SAMVAL**") Working Group's SAMVAL Code sets out minimum standards and guidelines for public reporting of mineral asset valuation in South Africa;[70]

iii) The Australasian Code for the Public Reporting of Technical Assessments and Valuations of Mineral Assets (the "**VALMIN**" Code) is prepared by the VALMIN Committee and regulates the public reporting of mineral asset valuation in Australasia;[71]

iv) The Society for Mining Metallurgy and Exploration ("**SME**") Standards and Guidelines for Valuation of Mineral Properties, which is a set of standards for the appraisal of the value of mineral property assets in the United States;[72] and,

v) The International Mineral Property Valuation Standards ("**IMVAL**") Template, which is a standards and guidelines template created for the harmonization of International Mining Codes and Standards by an international committee comprised of representatives of SAMVAL (South Africa), CIMVAL (Canada), VALMIN (Australasia), SME (USA), and the International Institute of Minerals Appraisers ("**IIMA**") (USA).[73]

3.19 All of the above noted mineral valuation codes are broadly consistent. I refer primarily to CIMVAL herein since the guidance provided in the CIMVAL Code is somewhat more comprehensive than the other mineral valuation codes. CIMVAL is part of the IMVAL umbrella organization of valuation standards group, which includes VALMIN, SAMVAL, SME and IIMA committees. Thus, I refer to CIMVAL not as a valuation code that Rio Tinto or its consultants were bound to follow but rather a guidance for best practices in the international mineral valuation industry.

3.20 The following are a number of key concepts under CIMVAL that are relevant to the valuation of Mineral Projects:

i) Mineral Property: A "**Mineral Property**" is any right, title or interest to property held or acquired in connection with the exploration, development, extraction or processing of minerals which may be located on or under the surface of such property, together with all fixed plant, equipment, and infrastructure owned or acquired for the exploration, development, extraction and processing of minerals in connection with such properties;

ii) Types of Mineral Properties: Mineral Properties can be categorized into the following four main types (although there are no clear-cut boundaries between types):[74]

- ***Exploration Properties***: A Mineral Property that has been acquired, or is being explored, for mineral deposits but for which economic viability has not been demonstrated;

70 SAMVAL Code 2016. [SI-32]
71 VALMIN Code 2015, Section 8.3, table 1. [SI-33]
72 SME Standards and Guidelines for the Valuation of Mineral Properties, 2017. [SI-34]
73 International Mineral Property Valuation Standards (IMVAL) Template, May 2018. [SI-35]
74 CIMVAL, page 8-11. [SI-31]

- ***Mineral Resource Properties***: A Mineral Property which contains a Mineral Resource that has not been demonstrated to be economically viable by a Feasibility Study or Prefeasibility Study;
- ***Development Properties***: A Mineral Property that is being prepared for mineral production and for which economic viability has been demonstrated by a Feasibility Study or Prefeasibility Study; and,
- ***Production Properties***: A Mineral Property with an operating mine, with or without a processing plant, which has been fully commissioned and is in production.

D. Selecting a Valuation Approach in a Mineral Property Valuation

3.21 The three valuation approaches to consider for a 'going concern'[75] are as follows:

i) ***Income-based approaches***: Generally, in the valuation of a business interest, the discretionary after-tax cash flow is of primary importance. When applying a going-concern approach, methodologies such as the discounted cash flow (DCF) or capitalized cash flow are preferred as these methods determine the present value of future cash flows that are expected to be generated by the business;

ii) ***Market-based approaches:*** Under market approaches, the value of a given subject asset or business interest are determined by reference to the values of similar assets that are traded in efficient public markets. Value relationships can be inferred from information pertaining to publicly traded business interests or transactions provided they are deemed sufficiently comparable to the subject business; and,

iii) ***Cost-based approaches***: Cost-based approaches are based on the principle that historical costs incurred contribute to future value or similarly, that a notional purchaser would not spend more on an asset than it would cost them to acquire or construct the asset themselves.

3.22 In the valuation of a mineral project, the valuation approach(es) selected by the valuator depends on the stage of exploration or development of the subject Mineral Property, as well as the type and quality of information that is available upon which a valuation conclusion may be based. Multiple approaches are typically applied and compared.[76]

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75 A company that has sufficient assets to meet its obligations as they arise is considered a going concern.
76 CIMVAL, pages 9-10. [SI-31]

3.23 According to CIMVAL, the following valuation approaches are generally considered appropriate for each type of Mineral Property:[77]

Figure 3.2: CIMVAL Valuation Approach Guidelines by Stage of Development

Valuation Approach	Exploration Properties	Mineral Resource Properties	Development Properties	Production Properties
Income	No	In some cases	Yes	Yes
Market	Yes	Yes	Yes	Yes
Cost	Yes	In some cases	No	No

3.24 CIMVAL's figure of the appropriate valuation approaches by stage of development as provided above is generally consistent with similar figures presented in the VALMIN Code[78] and the SAMVAL Code.[79]

3.25 Generally, market approaches are appropriate or widely used across all stages of project development, income approaches are only appropriate once economic viability has been demonstrated with a PFS or FS level study (i.e. when Ore Reserves have been defined), and cost approaches are only appropriate for exploration stage projects where economic viability has not yet been established.

E. Overview of the RTCM Projects

Benga

3.26 The Benga coal project ("**Benga**") was an advanced staged coal project.[80] As of the Acquisition Date Benga was under construction (on phase 1) had a planned production rate of 10 million tonnes per annum ("**Mtpa**") on a run of mine ("**ROM**") basis of both hard coking coal and thermal coal.[81] Rio Tinto considered it had the potential for expansion to a production rate of 20 Mtpa ROM.[82]

77 CIMVAL, page 22. [SI-31]
78 VALMIN Code 2015, Section 8.3, table 1. [SI-33]
79 SAMVAL Code 2016, Figure 1, page 14. [SI-32]
80 Rio Tinto Board Meeting Paper on the Acquisition of Riversdale Mining Limited dated December 16, 2010, page 3. [RT_00017283]
81 See discussion of the types of coal in Appendix 2.
82 Rio Tinto Technology and Innovation, Project Ralph Technical Due Diligence, dated January 7, 2011, pages iii and iv. [RT_00350519]

3.27 Benga was a joint venture between Riversdale (65% ownership initially, reduced to 60% in 2012) and Tata Steel Limited (35% ownership).[83] A Feasibility Study was prepared in July of 2009 and an internal Riversdale technical report was prepared in 2010.[84] As of the Acquisition Date, Riversdale reported JORC compliant Resources for Benga of 4,032 million tonnes. Included in the Resources were 502 million tonnes of Reserves.[85]

3.28 In its due diligence documentation for the Acquisition of Riversdale, Rio Tinto stated that Benga *"remain[ed] short of the feasibility level required by Rio Tinto"*, despite the completion of the 2009 Feasibility Study by Riversdale.[86]

3.29 Based on the information available at the Acquisition Date, the Benga project would likely have been classified as a Development Property under CIMVAL since it had established Proven and Probable Reserves, and had begun construction.

Zambeze

3.30 At the Acquisition Date, the Zambeze coal project ("**Zambeze**") was less advanced in its stage of development than Benga as its PFS was still in progress and it had not yet defined any Reserves. Thus, it would likely have been classified as a Mineral Resource Property under CIMVAL.[87] Rio Tinto had planned a production rate of 45 Mtpa ROM for Zambeze.[88,89] The JORC compliant resources for Zambeze as reported by Riversdale totalled 9 billion tonnes, most of which fell into the Inferred Resource category (the lowest level of certainty). In its due diligence documentation, Rio Tinto stated:[90]

> *"Publicly announced resource estimates for the Zambeze significantly overstate coal resources due to a lack of meaningful geological and mining cut-off criteria that is considered inconsistent with the requirements of the JORC Code. Non-compliance with the JORC Code may constitute a breach of the AusIMM Code of Ethics and ASX listing rules."*

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83 Rio Tinto 2011 Annual Report, Note 39, page 190. [SI-36]

84 Rio Tinto Technology and Innovation, Project Ralph Technical Due Diligence, dated January 7, 2011, Table 3.1, page 31. [RT_00350519]

85 Rio Tinto Technology and Innovation, Project Ralph Technical Due Diligence, dated January 7, 2011, Table 3.1, page 32. [RT_00350519]

86 Rio Tinto Technology and Innovation, Project Ralph Technical Due Diligence, dated January 7, 2011, Table 3.1, page 57. [RT_00350519]

87 Rio Tinto Board Meeting Paper on the Acquisition of Riversdale Mining Limited dated December 16, 2010, page 3. [RT_00017283]

88 Rio Tinto Technology and Innovation, Project Ralph Technical Due Diligence, dated January 7, 2011, pages iii, iv, vi. [RT_00350519]

89 Rio Tinto Technology and Innovation, Project Ralph Technical Due Diligence, dated January 7, 2011, page vi. [RT_00350519]

90 Rio Tinto Technology and Innovation, Project Ralph Technical Due Diligence, dated January 7, 2011, page 8. [RT_00350519]

Tete East (or EL945L Underground)

3.31 Coal exploration titles held by RTCM in the vicinity of Benga and Zambeze were collectively termed the Tete East coal project ("**Tete East**" or "**EL945**"). These tenements were at a preliminary stage of exploration and evaluation as of the date Rio Tinto acquired Riversdale and had not yet established any Resources under JORC.[91] Since it had not yet defined Resources under JORC, it would be classified as an Exploration Property under CIMVAL over the relevant period.

3.32 During its due diligence procedures, Rio Tinto noted that the Tete East licenses had "*limited potential for additional coking coal resources*" as the area was "*sparsely drilled in general, structurally complex and affected by intrusions. Little coal quality information [was] currently available […].*"[92]

Minjova

3.33 Unrelated to the acquisition of Riversdale, Rio Tinto Exploration also acquired an additional early exploration stage project in a nearby coal property in the Moatize Basin called Minjova ("**Minjova**"). This project was acquired by RTCM after the Riversdale transaction for $5 million and, as noted above, was included in some of Rio Tinto valuation models for the RTCM Projects.[93] JORC compliant Resources had not been defined at Minjova over the period from 2011 to 2012. Thus, it would also be classified under CIMVAL as an Exploration Property. The Minjova project was located to the east of the Tete East project (see Figure 1.1 above).

F. Income Approach - Discounted Cash Flow ("DCF") Methodology

3.34 A key principle of valuation theory is that the value of a mining project is a function of the future economic benefits that will accrue to the owner of that mine. Thus, the income approach is the preferred valuation approach to use when sufficient information is available to prepare a reliable forecast of those future economic benefits. The most widely used and understood methodology under the income approach to value is the discounted cash flow or DCF methodology.

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91 Rio Tinto Technology and Innovation, Project Ralph Technical Due Diligence, dated January 7, 2011, page iii. [RT_00350519]

92 Rio Tinto Technology and Innovation, Project Ralph Technical Due Diligence, dated January 7, 2011, page 8. [RT_00350519]

93 Rio Tinto internal memorandum, "Rio Tinto Coal Mozambique Impairment Valuation – Updated" dated January 11, 2013, page 6. [RT_00000380].

3.35 In a DCF model for a mineral project, a forecast of future cash flows (inflows and outflows) over the life of the mine is prepared using the technical information available with regard to the amount and quality of the resource data, estimates of the future prices at which the finished mineral products can be sold, and the operating and capital costs required to mine and produce the finished product. Then, a risk adjusted rate of return or discount rate is applied to the future cash flows using a mathematical formula to calculate the present value of each year's future cash flows. The sum of the present values of these future cash flows represents the net present value ("**NPV**") for the mining project at the valuation date.

3.36 It is important to recognize that the conclusions reached from a DCF analysis (in any industry) are only as reliable as the underlying data and assumptions that are used to construct the cash flow model. Thus, a DCF should only be used when the future cash flows of the project can be estimated with a sufficient level of certainty. As noted above, in the mining industry, this generally occurs on the successful completion of a PFS level study at which point Reserves have been defined and the mine plan and project costs have been developed in detail by the geologists, mining engineers or other technical persons competent (CPs) to opine on such matters.[94]

3.37 In the following section, I outline the elements of the DCF model and considerations specific to a coal mining project.

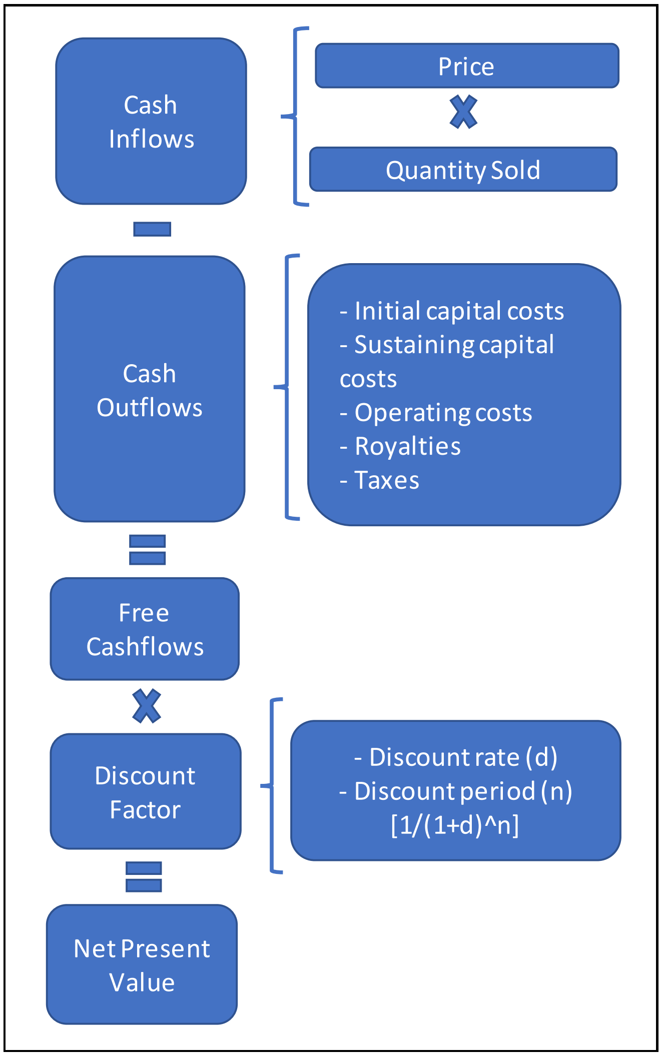
G. Elements of a Discounted Cash Flow Model

3.38 A DCF model measures all of the cash inflows and outflows for a given business interest or, in this case, a coal mining project. The remainder after all cash outflows are deducted from the cash inflows is the available cash flows to the project owners. A risk adjusted discount rate is applied to the available cash flows in each year to convert those future cash flows to a present value.

94 Rio Tinto's application of the DCF methodology to projects without defined Reserves is generally not consistent with international mineral valuation codes, however I have not been asked to provide my opinion on Rio Tinto's selection of valuation approach(es) or its application of the DCF to the RTCM Projects in 2010-2012, herein.

3.39 The following figure summarizes the key elements included in a DCF model used to value a coal mining project:[95]

Figure 3.3: Elements of a DCF Model



95 For the purposes of this discussion I refer to a pre-interest DCF expressed in real terms (before inflation) which yields the enterprise value (debt + equity) of a mineral project or business interest.

3.40 I discuss these elements in further detail below:

Cash Inflows

Gross Sales Revenue = Price x Amount of Coal Sold in Each Year:

- **Coal price** ($ per tonne): the price of coal is a function of the supply and demand for coal in local and international markets. The applicable price for the coal from a specific mine is dependent on the type of coal (hard coking coal, thermal coal, etc.), and the quality of the coal. Therefore, the price received will include adjustments for the coal's energy value or 'calorific value', moisture content and the content of any deleterious elements such as ash or sulphur. Forecasted prices applied in a DCF can be based on management's independent view, the view of a basket of industry analysts and/or consultants, and can also be informed by the prevailing and historical spot prices and futures prices;

- **Quantity sold** (in tonnes "t", or million tonnes "Mt")**:** the estimated production in each year of the life of the mine for each type of coal to be sold to customers in international markets. The forecasted quantity of coal sales begins with the JORC Resources, adjusted as appropriate for the level of certainty of Reserves and Resources to obtain the total ROM production from the mine in each year. The tonnes of ROM are then reduced for the estimated yield percentages in the washing process and plant processing process to obtain the tonnes of saleable production.

Cash Outflows

- **Royalties:** Mining companies are required to pay royalties on mineral revenues to the state. In Mozambique, from 2011 to 2013, a 3% royalty was applicable to all mineral production other than precious metals, gemstones and diamonds (for which higher royalties applied). Royalties are deducted from gross revenues to determine net revenues.

- **Operating costs (or "opex"):** Includes costs related to the extraction and production of coal, such as removal of overburden (i.e. waste material located above the coal resource), mining, processing, costs to transport the coal to the shipping point (where the seller assumes responsibility for the coal and any additional shipping costs) by truck, rail, barge or other means, and other costs related to the operation of the mine such as general and administrative costs.

  Operating costs are deducted from net revenues to determine the operating margin, also referred to as the earnings before interest, taxes, depreciation and amortization ("**EBITDA**").

- **Capital costs (or "capex"):** Represent costs expended to purchase, construct or otherwise increase the value of fixed assets, such as property, plant and equipment. There are two types of capital costs:

1. Initial (or expansion) capex: Initial capex is incurred prior to commercial production and expansion capex is incurred in order to increase production levels. This includes the capital required to conduct exploration, studies (geology, environment, logistics, economics, social, etc.), construction of the mine and the processing facilities and related infrastructure required to bring the project to production; and,
2. Sustaining capex: Capital costs expended during the operational life of the mine, which are required to keep the mine operating at its existing level of productive capacity (e.g. annual maintenance on mining equipment).

- **Closure costs:** represents the costs of closing down operations, clean-up, environmental restoration and/or rehabilitation of land associated with a mining project. These costs relate to legal obligations of a mining concession holder and typically occur during the last year of the life of the mine.[96,97]
- **Taxes:** Includes all corporate taxes, including federal, municipal and withholding taxes, paid to the government based on existing tax regimes.
- **Changes in net working capital:** Represents the cash required to operate the business. This is calculated based on estimated fluctuations in a business' accounts payable, accounts receivable, prepaid expenses and other current (short-term) assets and liabilities.

3.41 The EBITDA or operating margin, less closure costs, capex, taxes and changes in net working capital, represents the project's free cash flow ("FCF") in each year over the life of the mine.

H. Discounting

3.42 The future cash flows in a DCF are discounted to account for two issues: [98]

i) the time value of money; and,

ii) the risks of realizing the projected future income on the date estimated.

3.43 I discuss each of these issues in turn, below:

i) <u>Time value of money</u>: The time value of money refers to the concept that a dollar received today is worth more than a dollar received in the future because the dollar received today can be invested in a risk-free investment and earn a return (i.e. interest) with the passage of time.

96 "Mine Rehabilitation and Closure Cost", Richard Humphries dated July 2016. [SI-37]

97 Mozambique Mining Law No 20, Article 44(2)(p), dated August 18, 2014, page 8. [SI-38]

98 "Valuing a Business: The Analysis and Appraisal of Closely Held Companies, Fifth Edition" Shannon P. Pratt, page 56. [SI-39]

The time value of money is typically measured with reference to a “risk-free” rate of return, such as the interest rate on government debt. For instance, if the prevailing risk-free rate on a 1-year US Treasury bond were 3% per annum, then $1 received today would be equivalent to receiving $1.03[99] a year from today. Stated differently, $1 received one year in the future would only be worth $0.97 today.[100]

Thus, since money can earn interest on a risk-free basis over time, the farther out into the future a payment will be received, the less it is worth in today’s dollars. I illustrate this concept further in the following figure which shows that at a 10% rate of return or ‘discount rate’, $100 received today is worth the full $100, but $100 that will be received 3 years from today is only worth $75.13 today:

Figure 3.4: Illustration of the Time Value of Money

	Today	Year 1	Year 2	Year 3
Cash Received	$ 100	$ 100	$ 100	$ 100
Discounting	$(1+10\%)^0$	$(1+10\%)^1$	$(1+10\%)^2$	$(1+10\%)^3$

Present Value (PV):	
Today	$ 100.00
Year 1	$ 90.91
Year 2	$ 82.64
Year 3	$ 75.13
Sum of PVs:	**$ 348.69**

ii) Additional risk of ownership: In addition to requiring a rate of return just for the passage of time, investors also require compensation for taking on risk specific to their investment. Thus, investors require higher returns when investing in non-government debt, such as for corporate bonds, or equities (shares) in companies, because there is a chance that the investor will not receive the interest and principal obligations on time (or at all) or will not receive the expected dividends or be able to sell the equities for a profit (or for any amount) in the future. Thus, for all investments other than government debt, an additional rate of return over the risk-free rate – known as a *risk premium* – is required by investors, which, when added to the risk-free rate, results in a total required rate of return (i.e. the discount rate).

99 Calculated as: $1 x (1+3%) = $1.03.

100 Calculated as $1 ÷ (1+3%) = $0.97.

3.44 Forecasted future cash flows are discounted to a present value by applying a mathematical formula that changes with the period of time between the year when the future cash flows will be received and the valuation date. The formula used to discount future cash flows from any given year in the future is as follows:

$$PV = \frac{C_n}{(1 + d)^n}$$

Where,

PV = present value of future cash flow for a given year
Cn = cash flow received in year *n*
d = discount rate
n = number of years from the present year

Discount Rates

3.45 As noted above, a firm or enterprise can either be financed with equity or debt. The holders of the equity (shares) and debt (loans) require different rates of return to compensate them for the specific risks of holding those investments. Equity holders (shareholders) require an equity rate of return and debt holders require an interest rate of return or a debt rate of return. Since debt holders have priority over the value of the firm's assets and equity holders only receive a return of/on their investment if there is cash flow over and above the amount required to repay the debt holders, equity rates are, by definition, higher than debt rates for a given company to compensate equity holders for the higher level of risk they assume.

3.46 The discount rate applied in a DCF analysis can be either an equity rate of return (a shareholder's required rate of return to own shares) or a weighted average cost of capital ("**WACC**") which is a blended rate of the required rates of return of both equity and debt holders for a given business interest. The weightings applied to the equity and debt rates is the optimal levels of equity and debt for that business and is typically based on industry averages.

I. The Drivers of Value of a Coal Mine

3.47 The drivers of value of a coal mine generally include the following factors:

i) **Coal Price**: As spot and forecasted prices increase, value increases, and vice-versa.

ii) **The quantity and quality of the coal**: Generally, larger deposits and higher quality deposits are more valuable than smaller or lower quality deposits. For example, metallurgical coal sells for a higher price than thermal coal and is thus more valuable.

iii) **Annual production volumes and ramp up periods**: In a stable price environment, the sooner the coal can be mined and sold, the more valuable it generally is, due to discounting (time value of money and risk). For example, coal that won't be mined and sold until 20 years in the future will have very little value today due to discounting. The ramp up period refers to the amount of time required from the date the mine and plant are commissioned to move from zero production to production at full annual capacity.

iv) **Initial capital costs**: The higher the capital costs that must be spent up front before any coal is produced, the lower the value of the coal mine will be (all else equal). Initial capital costs have a very powerful impact on value as they are typically large cash outflows and they are not subjected to significant discounting as they are incurred in the initial or early years of the DCF model whereas the cash inflows (i.e. revenues from coal sales) are incurred over many years in the future and are subject to increasing discounting with each year into the future. Thus, as initial capital costs increase, a larger increase in future cash inflows must be realized to offset the higher initial costs on a present value basis (see example below).

v) **Operating costs**: The higher the operating costs required to mine, process and sell the coal, the lower the value, and vice versa.

vi) **Discount rate**: The higher the risk of realizing the future cash flows, the higher the discount rate and the lower the value. For long-term projects, a small change in the discount rate (i.e. 1%) can have a very large impact on the present value. Mines located in riskier countries or less developed regions, or with less certainty as to the quantity and quality of the mineral deposit or the costs to extract and process it, will generally be less valuable than mines that are located in more stable regions or that have a higher level of certainty over key project characteristics.

3.48 The impact of a number of the DCF elements identified above are illustrated in the figures below, which reflect the impact of discounting based on two different scenarios:

i) **Scenario 1**: A near-operational project with access to local infrastructure, where production and revenues are generated and operating expenses are incurred from Year 1, and where a relatively small amount of initial capex (of $25 million) is required in Year 1 to start the project. This is compared with,

ii) **Scenario 2**: An earlier-stage project that does not have access to infrastructure and thus requires relatively higher initial capex in Years 1 and 2 (of $100 million) before becoming operational, resulting in a delay in positive cash flow from production.

Secretariat

December 20, 2019

Figure 3.5: Scenario 1 (Immediate production, low initial capex)

(in $M)	YEAR						
	0	1	2	3	4	5	*Ref.*
Revenue		100	200	200	200	200	
Royalties		(10)	(20)	(20)	(20)	(20)	
Net Revenue		90	180	180	180	180	
Opex		(20)	(40)	(40)	(40)	(40)	
EBITDA		70	140	140	140	140	
Initial capex		(25)	-	-	-	-	
Sustaining capex		-	(15)	(15)	(15)	(15)	
Closure Costs		-	-	-	-	(50)	
Taxes		(18)	(35)	(35)	(35)	(35)	
Change in NWC		(10)	(10)	(10)	(10)	(10)	
Free Cash Flows (FCFs)		18	80	80	80	30	***A***
Discount Factor	*10%*	0.9091	0.8264	0.7513	0.6830	0.6209	***PV = 1 / (1 + 10%) ^ No. Yrs***
Discounted FCFs		16	66	60	55	19	***A * PV***
Sum of DCFs (FMV)	**215**						

3.49 In order to illustrate the impact of time value of money and initial capital costs in a DCF analysis, I compare the net present value ("**NPV**") of $215 million from the figure above to the NPV of $110 million in the figure below:

Figure 3.6: Scenario 2 (2 year delay in production, higher initial capex)

(in $M)	YEAR								
	0	1	2	3	4	5	6	7	*Ref.*
Revenue		-	-	100	200	200	200	200	
Royalties		-	-	(10)	(20)	(20)	(20)	(20)	
Net Revenue		-	-	90	180	180	180	180	
Opex		-	-	(20)	(40)	(40)	(40)	(40)	
EBITDA		-	-	70	140	140	140	140	
Initial capex		(50)	(50)	-	-	-	-	-	
Sustaining capex		-	-	-	(15)	(15)	(15)	(15)	
Closure Costs		-	-	-	-	-	-	(50)	
Taxes		-	-	(18)	(35)	(35)	(35)	(35)	
Change in NWC		-	-	(10)	(10)	(10)	(10)	(10)	
Free Cash Flows (FCFs)		(50)	(50)	43	80	80	80	30	***A***
Discount Factor	*10%*	0.9091	0.8264	0.7513	0.6830	0.6209	0.5645	0.5132	***PV = 1 / (1 + 10%) ^ No. Yrs***
Discounted FCFs		(45)	(41)	32	55	50	45	15	***A * PV***
Sum of DCFs (FMV)	**110**								

3.50 The second model has two main differences in assumptions compared to the first model:

i) Production begins 2 years later, resulting in delayed revenue and related costs; and,

ii) Initial capex is $75M higher in Years 1 and 2.

3.51 The earlier years in a DCF model have a greater impact on NPV by virtue of the discount factor. As illustrated in the figures above, at a discount rate of 10%, Year 1 is weighted at a factor of over 90% - i.e. a discount factor of 0.9091. By comparison, Year 2 is weighted at less than 83% of its future value – i.e. a discount factor of 0.8264, and the weightings continue to diminish for Year 3 onwards in the examples above.

3.52 Therefore, negative cash flows in the earlier years of a forecast, due to production, capex or any other assumptions, have a greater impact on the total NPV (i.e. the sum of the PV of cash flows) than cash flows that occur later in the forecast period.

3.53 This is evident by examining Scenario 1 above. Years 2, 3 and 4 have the same undiscounted free cash flows of $80 million per year. However, after discounting, the free cash flows of the same three years are $66 million, $60 million, and $55 million, respectively. This is due to the effect of discounting.

3.54 In comparing Scenario 1 and Scenario 2 above, due to the additional required capex and the resulting delay in earning positive cash flow in Scenario 2, the earlier years in the cash flow model (Years 1 and 2) incur negative cash flows in Scenario 2, and have a greater weighting on the overall FMV. The cash flow model for Scenario 2 continues for two additional years into the future in order to complete the production schedule, and generates positive cash flows in those years, but they have a lower weighting on the total FMV due to the impact of discounting. In this example, the overall NPV in Scenario 2 is lower than that of Scenario 1 by $105 million ($215 - $110 million), but only requires $75M more in initial capex.

J. Market Approach to Value a Coal Mine

3.55 Market based valuation techniques are recognized as valid methodologies for mineral projects at all stages of development under the internationally recognized mineral valuation codes.

3.56 The following market based valuation methodologies are typically used in valuing mineral projects:

i) **Comparable Transactions**: Under this approach, value metrics (e.g. price paid per tonne of coal Reserves or Resources) observed in transactions of other mining projects that are deemed suitably similar to the target project being valued are applied to the target project in order to calculate an estimated range of values.

Since all mineral projects are unique it is important that value metrics be obtained from sufficiently comparable mineral projects (i.e. similar mineralization type and grade, mining method, size, stage of development, etc.) and either be from a reasonably proximate date to the valuation date, or be adjusted for changes in market conditions between the valuation date and the date of the comparable transaction.

In practice, it is difficult to identify market transactions that involve mineral projects that are sufficiently comparable to be relied upon as a primary valuation approach in a valuation opinion. More frequently, market transactions involving broadly similar assets are used as a secondary valuation approach or as a 'sense' check on the conclusions reached using a primary valuation approach (such as a DCF); and,

ii) **Market Capitalization Approach**: Under this approach, the FMV of a mineral project or a group of mining projects is calculated by reference to the market capitalization (share price x shares outstanding) of a publicly traded entity which holds the project(s). Adjustments may be required for acquisition premiums, net debt, and reductions for the value of any other mineral projects held by the company. Given that Riversdale was delisted on July 7, 2011,[101] this methodology is not applicable for valuations of RTCM's assets for dates thereafter.

K. Cost Based Approaches to Value a Coal Mine

3.57 As discussed above, the Cost Approach is relevant for early-stage mineral projects, such as Exploration and Mineral Resource Properties.

3.58 CIMVAL explains that '*The Cost Approach is based on the principle of contribution to value. The appraised value method, is one commonly used method where <u>exploration expenditures</u> are analyzed for their contribution to the exploration potential of the Mineral Property*'.[102] [emphasis added]

3.59 Generally, since value is prospective, historical costs may not provide a reliable measure of prospective value. However, for early stage mineral projects, a buyer will consider exploration and development costs incurred by the owner as a measure of the value one would be willing to pay since those are costs that needed to be incurred to bring the asset into its present state.

101 Rio Tinto 2011 Annual Report, Note 39, page 190. [SI-36]
102 CIMVAL section G3.1. [SI-31]

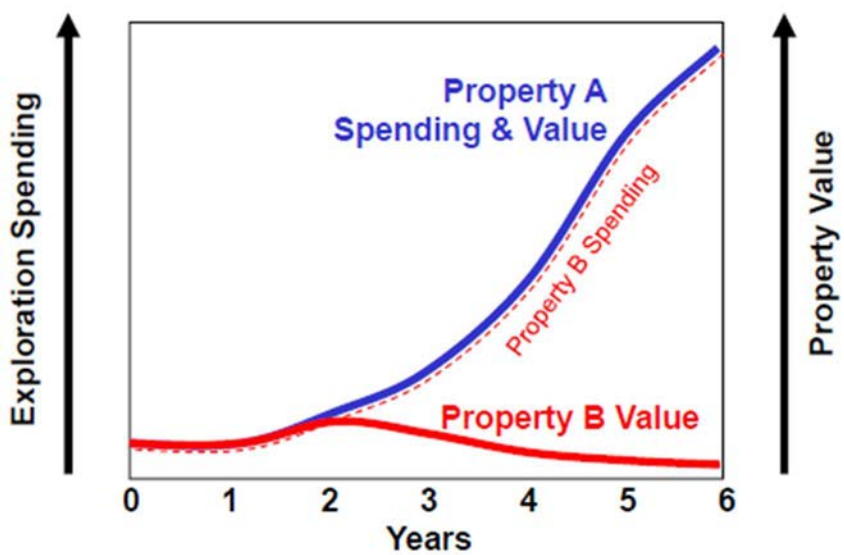
3.60 Cost approaches to value measure exploration potential by the level of costs incurred, assuming it reflects an expectation of its prospective value. The real value of an exploration property lies in its potential for the existence and discovery of an economically viable mineral deposit. Determining whether an exploration property will become economically viable in future includes the consideration of whether the expected revenue the deposit could generate (given the volume and grade of the minerals that may be extracted) is expected to be sufficient to compensate the owner for all of necessary exploration, processing, and infrastructure costs (including mining and transportation infrastructure, power, water supply, etc.) and provide a sufficient amount of profit to the owner, commensurate with the risk and timing of those expected revenues and costs. Exploration costs and their results can change the value of a project whereby the value may: [103]

i) Increase with positive results (Property A in the figure below);

ii) Decrease with poor results (Property B in the figure below); or

iii) Limit the value due to identified physical limits to the mineral potential.

Figure 3.7: Example of Exploration Expenditures and Value [104]



3.61 There are two alternatives to quantify a range for estimated value based on costs:

i) Exploration costs incurred to advance the relevant project, adjusted for the period of time between the valuation date and the date the costs were incurred to consider inflation. The costs to acquire a Mineral Property are not relevant for the purposes of this analysis (and rather would be considered in the comparable transactions method to valuation – a market approach); and,

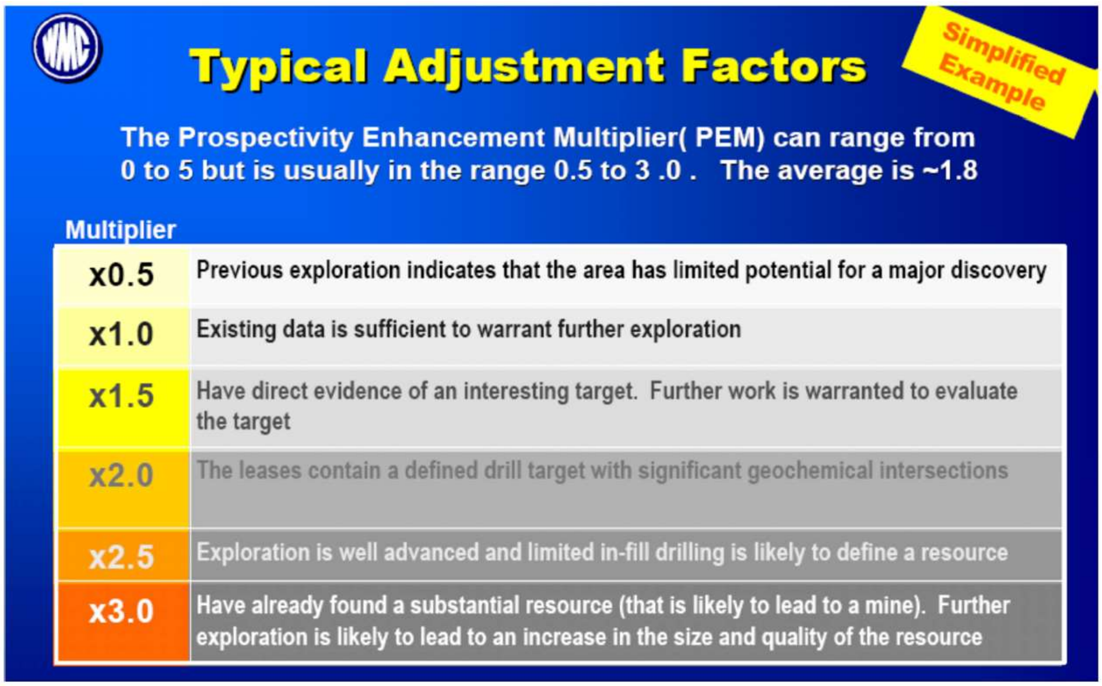
[103] William E. Roscoe, RPA, Mineral Appraisal Meeting, Denver, 1-3, October 2003. [SI-40]
[104] William E. Roscoe, RPA, Mineral Appraisal Meeting, Denver, 1-3, October 2003. [SI-40]

ii) A cost multiple method that applies a likelihood of success factor to the costs incurred, that is related to the exploration potential based on assessments with respect to the level of prospectivity of each area. The application of a multiple to the costs recognizes that the owner of a mineral asset creates value with successful exploration efforts. This is further explained below.

L. Multiple of Exploration Expenditures Approach

3.62 The Multiple of Exploration Expenditure approach ("**MEE**") uses exploration expenditure incurred (not acquisition price) as a base value for a Prospect and applies a Prospectivity Enhancement Multiplier ("**PEM**") to the expenditure. The PEM is related to the likely success factor of identifying resources as well as market factors and typically ranges from 0 to 5, or 0.5x to 3x as follows.[105]

Figure 3.8: Typical PEM Adjustment Factors under the MEE Cost Approach



105 Applying the Cost Approach to Valuation of Exploration Stage Mineral Assets by André J van der Merwe, January 2017. [SI-41]; Larry Smith, "Valuation 4: Cost Approach", page 31. [SI-42]

4. SUMMARY OF RIO TINTO FINANCIAL MODELS[106]

A. Introduction

4.1 Rio Tinto used DCF models to determine the values of the assets and liabilities of Riversdale for the purpose of the Riversdale acquisition, to determine the value of RTCM's assets and liabilities for financial reporting purposes, for RTCM business planning, and for impairment testing of the RTCM CGU as of the 2011 fiscal year end (December 31, 2011), the 2012 fiscal half year (as of June 30, 2012), and the 2012 fiscal year end (December 31, 2012).

4.2 DCF models can be prepared and used for different purposes including formal valuations to determine FMV or FV in either a notional context or in the context of an actual transaction, or may be used for management purposes to assess different available options to develop a project in an attempt to maximize a mining project's value. As part of my analysis of the various valuations and DCF models prepared by Rio Tinto and its financial advisors, I considered the context and intended purpose of each as far as possible, based on the available information with a view to determining whether each model provided (or could provide) a reliable measure of the fair market value.

4.3 In the course of my analysis, I have reviewed many iterations of different DCF models prepared by Rio Tinto for the RTCM Projects from 2010 to 2012 and I have compared the operating and capital costs across the different reference versions of these DCF models.

4.4 The value analyses that I have reviewed, and based my opinions upon herein, include the following:[107]

i) **The Acquisition Model**: DCF models prepared by Rio Tinto management and staff from October 23, 2010 to November 23, 2010 for the purposes of the Riversdale Acquisition. The primary Acquisition Model I refer to herein is the November 23, 2010 model that provided a value of $3.7 billion[108] and represented Rio Tinto's central estimate that was presented to the Rio Tinto Board of Directors on December 16, 2010 (the "**Acquisition Model**");[109]

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106 Although I have reviewed Rio Tinto's Project Evaluation Guidance ("**PEG**"), I do not provide comments on the PEG herein since it does not impact my opinions. "Rio Tinto's Project Evaluation Guidance (PEG): Volume 2 – A Practitioner's Guide" February 2012, page 2. [RT_00000810]

107 I have reviewed approximately 300 iterations of Rio Tinto's DCF models for the RTCM Projects from 2010 to 2012, that were presented in the two different DCF model frameworks discussed. I describe the three specific iterations that I have relied upon in my analysis in this section.

108 2010.11.23_Acquistion Model_RT_00074485.xlsx

109 Rio Tinto presentation, "Project Ralph: Board Meeting – 16 December 2010", page 7. [RT_00010760]

ii) **The Business Unit Model**: DCF models that were prepared by RTCM from April 2012 to February 2013.[110] The primary Business Unit Model I have referred to herein with respect to the value of the RTCM Projects as of the half-year impairment assessment for June 30, 2012 is the iteration of the Business Unit Model that was prepared prior to, and was available for reference in a management meeting that was held in Brisbane on May 11, 2012 which was attended by Thomas Albanese, Guy Elliott, and RTCM and RTE management.[111] This model concluded on a value of negative $680 million for the RTCM Projects (on a 100% basis).[112] I refer to this version of the Business Unit Model as the "**Brisbane Model**" herein.

Another iteration of the Business Unit Model that I refer to herein, in relation to the impairment assessment that was conducted for the fiscal year ended December 31, 2012, was available for reference in a November 26, 2012 Rio Tinto Audit Committee meeting. This model concluded on a value of $5.3 billion (on a 100% basis) and $4.3 billion (on Rio Tinto's ownership interest).[113] I refer to this version of Business Unit Model as the "**November BU Model**" herein.[114]

B. The Acquisition Models

4.5 The Acquisition Models provide the value of the projects over which Riversdale had control prior to the Acquisition Date including: Benga, Zambeze, Tete East (EL945L), EL948L, Zambeze West and ZAC. These models provide the equity value of Riversdale as they deduct net debt and other liabilities (unallocated overheads) from the values of its mineral projects.

4.6 Over the period between October 28, 2010[115] and November 23, 2010, 39 iterations of the Acquisition Model were generated with NPV conclusions ranging from between negative $4.1 billion to positive $9.8 billion. The average and median of the NPV values for these 39 iterations were $3.6 billion and $3.3 billion, respectively.

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110 For all of the Business Unit Models, when opened in a current version of MS Excel, all calculations that depend on discount factors display the error message "#VALUE". In order to correct this and restore all of the Business Unit Model calculations, the opening discount periods at cells C8 and D8 of the ''Global Inputs" tab must be replaced. The NPV figures noted herein from the Business Unit Models are based on replacements to these two cells to reflect mid-period discounting relative to the valuation dates stated in each specific Business Unit Model, which is consistent with the description of these cells in the Business Unit Model that they represent "Mid-Period Cash Flows".

111 Deposition of Mr. Morris dated November 8, 2018, pages 96-102.

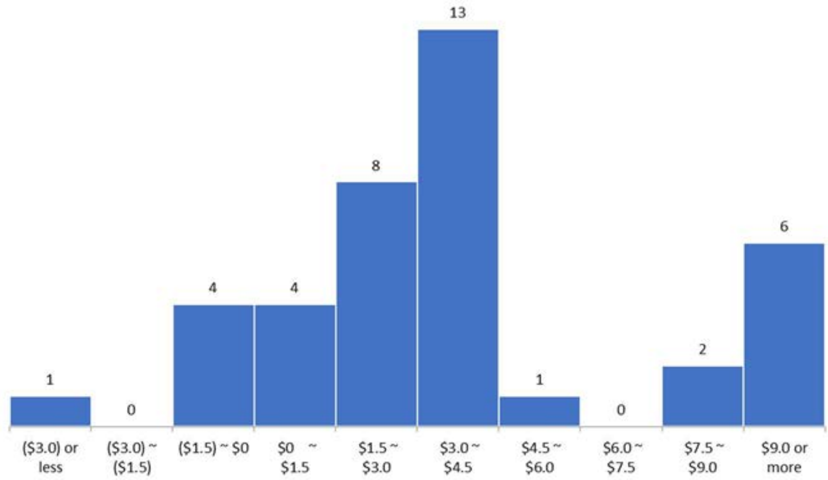
112 Defendants' Exhibit 42 (Native).xlsx.

113 A paper from Dan Larsen, Group Controller, "Rio Tinto Audit Committee Meeting 26 November 2012 Review of Carrying Values", page 18. [RT_00000331]

114 I have used "RT_SEC_00295084.xlsx" financial model to define the November BU Model.

115 The latest iteration of the Acquisition Model before October 28th was saved in September 28th. Due to the long interval, I regarded that any iterations prior to October 28th, 2010 are less relevant for the decision made on November 23rd, 2010.

Figure 4.1: Histogram of Acquisition Model iterations[116]



Ranges of Riversdale NPVs analysed between October 28th and November 23rd, 2010 in billions of U.S. dollars

4.7 The value conclusion reached in the Acquisition Model was an equity value for Riversdale of $3.7 billion, as of November 23, 2010. This was the figure that was presented to the Rio Tinto Board of Directors on December 16, 2010 as part of the proposal to acquire Riversdale.[117]

4.8 The Acquisition Model was based on the following key assumptions:

i) Pricing: Rio Tinto's PEG base pricing in real $/t as of November of 2010 was used for all of the valuations (expressed on a calendar year basis, on an FOB or "free on board" basis).[118]

ii) Valuation date: January 1, 2011.[119]

iii) Discount rate: 8% real rate for Mozambique (7% base rate, plus 1% country risk for Mozambique).[120]

116 Includes the NPV output from the 39 iterations of the Acquisition Model that I reviewed that were run with different inputs/assumptions between October 28, 2010 and November 23, 2010.

117 Rio Tinto presentation, "Project Ralph: Board Meeting – 16 December 2010", page 7. [RT_00010760]

118 Assumptions page of "2010.11.23_Acquistion Model_RT_00074485". FOB is a shipping term that stipulates when the risks and costs shift from the seller to the buyer. Under FOB, the risks and costs shift to the buyer once the coal has been loaded on board at the port of departure (i.e. Mozambique in this case). The buyer bears all transportation and other costs and risks for the goods from that point. Information from www.incotermsexplained.com. [SI-43]

119 Assumptions page of "2010.11.23_Acquistion Model_RT_00074485", cell K15.

120 Assumptions page of "2010.11.23_Acquistion Model_RT_00074485", cell K20.

iv) Benga:[121] The Acquisition Model included a total of 452.5 million tonnes of ROM production, or total coal Resources mined with 214.5 million tonnes of salable coal (66% hard coking coal and 34% thermal coal) over a 24 year mine life from 2011 to 2034. A total of 31.9 million tonnes was assumed to be shipped by rail from 2011 to 2017, and then a total of 182.6 million tonnes was assumed would be shipped via barge over the Zambeze River from 2015 to 2034. The total initial capital costs were estimated at $2.0 billion which included $99 million for Chinde port development. RTCM's 65% ownership interest in the Benga project was valued using the discounted cash flow (DCF) method at $1.14 billion at January 1, 2011.

v) Zambeze:[122] The Acquisition Model included a total of 1,530 million tonnes of coal ROM production (at a maximum of 45 Mtpa ROM), with total salable coal production of 583.4 million tonnes at a maximum of 19 Mtpa (59% coking coal and 41% thermal coal) over a 35 year mine life commencing in 2015 until 2049. The model assumed 100% of the coal would be shipped via barge over the Zambeze River. The total capital costs were estimated at $3.73 billion which included $531 million for dredging and port development. RTCM's 100% ownership interest of the Zambeze project was valued using a DCF at $1.44 billion, however a value of $1.5 billion was included in the total company valuation, which was calculated as 60% of the $1.44 billion DCF valuation plus $709 million per a possible transaction for 40% of Zambeze with WISCO.[123]

vi) Tete East (EL945L):[124] The Acquisition Model included a total of 153.2 million tonnes of coal ROM production at a maximum of 6 Mtpa and salable coal of 105.1 million tonnes at a maximum of 4.5 Mtpa (70% coking coal and 30% thermal coal), commencing in 2016 to 2044, or a 29 year mine life. The total capital costs were estimated at $943 million which included $0 for logistics capex (these costs were included in the Zambeze and Benga assumptions). The model assumed 100% of the coal was to be shipped by barge. RTCM's 100% interest in the Tete East project was valued using a DCF to be $344 million as of January 1, 2011.

4.9 The figure below is a summary of Rio Tinto's value conclusions per the Acquisition Model as of January 1, 2011.

121 'BengaRiver' tab of "2010.11.23_Acquistion Model_RT_00074485.xlsx".
122 'Zambeze' tab of "2010.11.23_Acquistion Model_RT_00074485.xlsx".
123 'Summary' and 'WISCO' tabs of "2010.11.23_Acquistion Model_RT_00074485.xlsx".
124 'EL945' tab of "2010.11.23_Acquistion Model_RT_00074485.xlsx".

Figure 4.3: Acquisition Model as of January 1, 2011[125]

Mine/Project	Project Status	Riversdale Ownership	Valuation - Riversdale share		
			US$M	A$M	A$/share
Benga - via barge to Chinde	Construction	65%	$1,143	$1,153	$4.7
Zambeze - 45Mtpa ROM*	Pre-Feasiblity	100%	$1,575	$1,588	$6.5
Benga & Zambeze			**$2,719**	**$2,741**	**$11.2**
Zululand Anthracite Colliery	Operating	74%	$30	$30	$0.1
Riversdale Anthracite Colliery	Impaired	74%	-	-	-
Unallocated Overheads		100%	($16)	($16)	($0.1)
Net Debt/Cash		100%	$545	$549	$2.2
Capital Raising / Placement		100%	-	-	-
Outstanding Options Proceeds		100%	$64	$64	$0.3
Subtotal			**$3,341**	**$3,368**	**$13.8**
EL 945 - Underground Case	Exploration	100%	$344	$347	$1.4
Other Tenements	Exploration	100%	**$344**	**$347**	**$1.4**
Total Value			**$3,685**	**$3,715**	**$15.2**

** includes 40% sale at value comparable to previous WISCO proposal*

C. The Business Unit Model

4.10 In 2012, Mr. Maglione, an RTCM employee, created a new DCF valuation model for the RTCM Projects under the direction of Mr. Morris, the General Manager of Strategy and Analysis of RTCM.[126]

4.11 The creation of a new financial model after the Acquisition, rather than using the model used in the Acquisition, was normal business practice. As Mr. Morris explained,

> *"…the model that would be used for an acquisition…would not be expected to be as detailed as a model that would be used over the long-term for an asset, or a suite of assets like RTCM. You do not have access to the same level of information during [the] acquisition process, and it is not meant to be as detailed as something we would be looking to produce."*[127]

4.12 In my experience, it would be standard practice for a mining company to prepare its own detailed life of mine cashflow model for a newly acquired mineral project that it would then update periodically, as necessary, to reflect the updated level of knowledge and circumstances at the mine. This would include changes or updates to any inputs in the DCF model including: the JORC Reserves and Resources; mine construction and related infrastructure requirements, plans and costs (including logistics); mining and processing methods and costs; mine schedule; and, any other updates to the life of mine development plan required to reflect current and future expected economic, environmental, social and political conditions.

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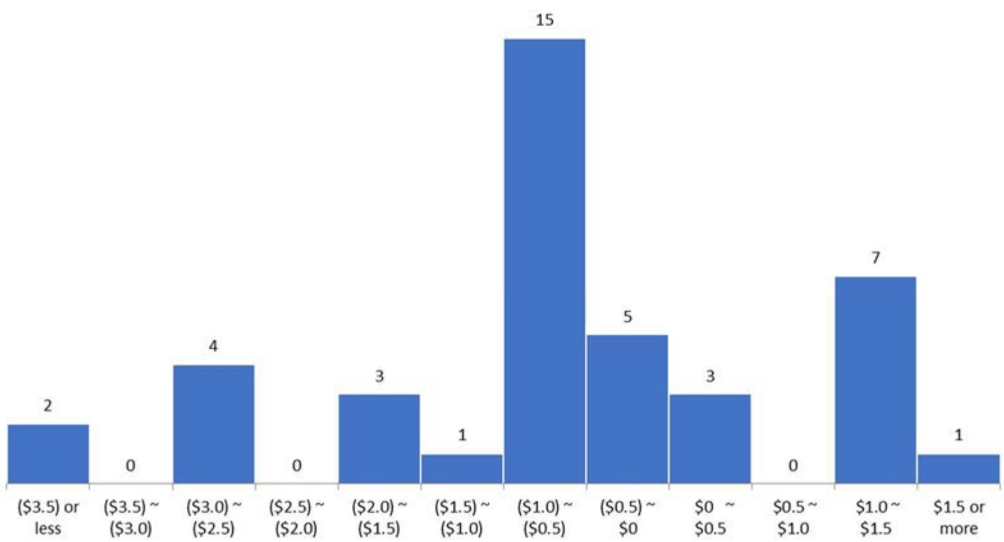
125 'Summary' tab of "2010.11.23_Acquistion Model_RT_00074485.xlsx".
126 Deposition of Mr. Morris dated November 8, 2018, page 151-152.
127 Deposition of Mr. Morris dated November 8, 2018, page 38.

4.13 In contrast to the Acquisition Model which provided the equity value of Riversdale, the Business Unit Model provided the asset value of each of the mining projects in the RTCM CGU (i.e. was before any adjustment for net debt or other liabilities) and provided conclusions both on a 100% ownership basis and based on Rio Tinto's ownership percentage (i.e. including only its 60%[128] interest in Benga).

4.14 For the purposes of my analysis of the value as of June 30, 2012 (date of half-year impairment assessment) herein, I selected the 41 iterations of the Business Unit Model provided to me that were prepared from May 2, 2012 to July 13, 2012.[129]

4.15 The NPV conclusions from the 41 iterations of the Business Unit Model from May 2, 2012 to July 13, 2012 range from negative $4.0 billion to positive $1.7 billion. The average and median of those NPV values are negative $635 million and negative $550 million, respectively.

Figure 4.4: Histogram of Business Unit Model Iterations (May 2, 2012 to July 13, 2012, 100% basis) – HY 2012 Assessment



4.16 As shown in the figure above, the conclusion of an NPV of negative $680 million (100% basis) in the Brisbane Model fell within the central tendency values of the multiple iterations prepared in the period leading up to Rio Tinto's half year ("**HY**") 2012 fiscal period.

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128 Defendant's Exhibit 42 (Native).xlsx, 'Benga Phase 1 Calcs' tab, cells G24 and G26.

129 I considered the iterations of the Business Unit Model that were prepared before April 12, 2012 to be incomplete. I also considered that the iterations prepared between April 12, 2012 and May 2, 2012 were complete in terms of model structure and functionality, but the input data used therein were not complete. For example, Business Unit Model iterations between April 12th and May 2nd didn't have any inputs on how products from Zambeze would be transported.

4.17 The Brisbane Model was based on the following key assumptions:[130]

i) Ownership Percentage: A 5% ownership interest was assumed to be transferred to the GOM resulting in a 60% ownership interest for RTCM (compared with 65% in the Acquisition Model).

ii) Pricing: Rio Tinto's PEG price forecasts as of February 2012.

iii) Valuation date: May 1, 2012.

iv) Discount rate: 9% (real WACC).

v) Benga:[131] The Brisbane Model included a total of 860.4 million tonnes of ROM production (100% basis) with 387.8 million tonnes of salable coal produced at a maximum of 8.4 Mtpa (60% hard coking coal and 40% thermal coal) over a 60 year mine life from 2012 to 2071. This model assumed all production would be shipped by rail from the existing Sena to Beira route from 2012 to 2017 and would then transition to a new "greenfield" rail from 2018 to 2020, with 100% of production being shipped via greenfield rail from 2021 onwards. The total initial capital costs (100% basis) were estimated at $1,183 million (all logistics infrastructure and support costs were modelled separately – see below). RTCM's 60% ownership interest in the Benga project was valued at $561 million,[132] before the related infrastructure and other required service costs, etc.

vi) Zambeze:[133] The Brisbane Model included a total of 1,591.1 million tonnes of coal ROM production (at a maximum of 31.5 Mtpa), with total salable coal production of 551.0 million tonnes at a maximum of 12.8 Mtpa (55% coking coal and 45% thermal coal) over a 54 year mine life commencing in 2017 until 2070. The model assumed 100% of the coal would be transported to port via rail, initially on the Sena-Biera route (2017-2018), transitioning to greenfield rail from 2019 such that 100% was planned to be transported via greenfield rail from 2022. The total capital costs were estimated at $2.46 billion which included $301 million in power, port and other enabling infrastructure, but rail infrastructure costs were included elsewhere. RTCM's 100% ownership interest of the Zambeze project was valued at an NPV of $379 million.[134]

130 Defendants' Exhibit 42 (Native).xlsx, 'Benga Consolidated', 'Global Inputs', 'Benga Phase I Calcs' tabs.
131 Defendant's Exhibit 42 (Native).xlsx, 'Benga Consolidated' tab.
132 Defendant's Exhibit 42 (Native).xlsx, 'Discrete Values' tab.
133 Defendant's Exhibit 42 (Native).xlsx, 'Zambeze Phase 1 Calcs' tab.
134 Defendant's Exhibit 42 (Native).xlsx, 'Discrete Values' tab.

vii) Tete East (EL945L):[135] The Brisbane Model included a total of 1,507 million tonnes of coal ROM production at a maximum of 31.2 Mtpa and salable coal of 518.4 million tonnes at a maximum of 10.7 Mtpa (55% coking coal and 45% thermal coal), commencing in 2020 to 2070, or a 51 year mine life. The total capital costs were estimated at $2,374 million which included $135 million for power and other enabling infrastructure. Again, the rail and other infrastructure costs were included elsewhere in the model. The model assumed 100% of the coal was to be transported by rail with 45% planned on the Sena-Biera route in 2020 (and 55% on greenfield rail) and 100% of the coal being transported on greenfield rail from 2021 onwards. RTCM's 100% interest in the Tete East project was valued at an NPV of $354 million.[136]

viii) Minjova:[137] The Brisbane Model added an additional mining project that was not included in the Acquisition Model as it was not acquired by Rio Tinto from Riversdale but was later added by Rio Tinto to the RTCM CGU. This model included a total of 1,946.9 million tonnes of ROM production from Minjova at a maximum of 41.6 Mtpa and salable coal of 763.4 million tonnes at a maximum of 16.6 Mtpa (20% coking coal and 80% thermal coal), commencing in 2020 to 2070, or a 51 year mine life. The total capital costs were estimated at $2,033 million which included $87 million for power and other enabling infrastructure. Again, the rail and other infrastructure costs were included elsewhere in the model. The model assumed 100% of the coal was to be transported by rail with 86% planned on the Sena-Biera route in 2021 (and 14% on greenfield rail) and 100% of the coal being transported on greenfield rail from 2022 onwards. RTCM's 100% interest in the Tete East project was valued at an NPV of $816 million.[138]

ix) Power Infrastructure: In the Brisbane Model, the NPV of the elements of the supporting infrastructure relating to the Benga Power Plant, and the greenfield railway corridor were modelled separately to the mining projects. The Benga Power Plant was valued at a positive NPV of $5 million (RTCM's 19% share basis) and assumed that 66% of the revenue would come from the sale of power to non RTCM entities (EDM and Eskom), and assumed capital costs for power infrastructure of $1.6 billion (100% basis) of which it was assumed that RTCM's share would be $302.7 million.[139]

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135 Defendant's Exhibit 42 (Native).xlsx, 'Tete East Phase 1 Calcs' tab.
136 Defendant's Exhibit 42 (Native).xlsx, 'Discrete Values' tab.
137 Defendant's Exhibit 42 (Native).xlsx, 'Minjova Phase 1 Calcs' tab.
138 Defendant's Exhibit 42 (Native).xlsx, 'Discrete Values' tab.
139 Defendant's Exhibit 42 (Native).xlsx, 'Discrete Values', 'BPP Phase 1 Calcs' tabs.

x) Greenfield Rail and Port Infrastructure: The NPV of the greenfield rail corridor to support the various coal mining projects was valued at negative $2,969 million. This NPV was based on RTCM's estimated share of capital costs of $3,639 million for the rail component from 2014 to 2023 and $3,693 million for the port infrastructure from 2014 to 2023.[140] This NPV also included an assumption that a third party would pay for 6% of the capex and that Rio Tinto would be able to sell excess rail capacity at $40/t to third parties to generate revenues and offset some of the up-front capital costs.[141]

xi) Enablers: Similar to the infrastructure, additional support costs including corporate and site support costs (NPV of negative $369 million) and support costs for the Sena-Biera rail line from 2013 to 2020 (NPV of negative $150 million), and were modelled separately from the mining projects.[142]

D. Comparison of Operating and Capital Expenses Across the Models

Operating Expenses

4.18 In comparing the assumptions on opex in the Acquisition Model and Business Unit Models, I have separated the opex into i) logistics related opex and ii) other opex items to isolate how the assumptions differ between the financial models in terms of the logistics given that the Acquisition Model assumes barging whereas the Brisbane Model and November BU Model both assume greenfield railway.

4.19 From the Acquisition Model, I grouped the opex line items entitled, 'Fee Based Transport', 'Barge', and 'Fee Based Port' as logistics related opex items. In the BU Models, I included the opex cost items labelled, 'Rail/Barge/Road Train', and 'Port/Transhipment' as logistics related opex.

140 Defendant's Exhibit 42 (Native).xlsx, 'Green Field Corridor Calcs' tab.
141 Defendant's Exhibit 42 (Native).xlsx, 'Green Field Corridor Calcs' tab.
142 Defendant's Exhibit 42 (Native).xlsx, 'Discrete Values' tab.

Figure 4.7: Comparison of operating expenses by model types[143]

(100% basis)	Acquisition Model	Brisbane Model	November BU Model
ROM (Mt) (a)	2,135	5,905	3,138
Product (Mt) (b)	903	2,220	1,045
OPEX ($ millions) (c)	**47,471**	**147,712**	**77,867**
Logistics OPEX (d)	12,677	15,135	10,595
Other OPEX (e)	34,793	132,578	67,272
OPEX per ROM ($/t) (c/a)	*22*	*25*	*25*
Logistics OPEX per ROM ($/t) (d/a)	*6*	*3*	*3*
Other OPEX per ROM ($/t) (e/a)	*16*	*22*	*21*
OPEX per Product ($/t) (c/b)	*53*	*67*	*75*
Logistics OPEX per Product ($/t) (d/b)	*14*	*7*	*10*
Other OPEX per Product ($/t) (e/b)	*39*	*60*	*64*

4.20 The figure above shows that although the total opex is highest in the Brisbane Model, followed by the November BU Model and then the Acquisition Model, the total opex per tonne of production is highest in the November BU Model, followed by the Brisbane Model and the Acquisition Model is again the lowest. However, for logistics opex, the Acquisition Model has the highest opex/tonne followed by the November BU Model and then the Brisbane Model. The logistics opex is higher in the Acquisition Model on a cost/tonne basis than the Brisbane Model and November BU Models cost due to the relatively cheaper opex assumed for the greenfield rail/port as compared to the barging option.

4.21 For the Acquisition Model, the logistics opex per tonne of total product of $14/t is comprised largely of the barging costs. Fee Based Transport and Fee Based Port costs only occur between 2011 and 2017 until the barging capacity is ramped up to 100%. The assumed barging opex starts with $24/t of product in 2015, and gradually decreases to $13/t in 2019, and remains constant thereafter.

4.22 In the Brisbane Model, the Sena-Biera rail is used from 2012 to 2020 at $40.6/t product.[144] The transition of logistics capacity from the Sena-Biera rail to the greenfield railway takes 3 years starting from 2018. The greenfield railway opex stabilized to $4.15/t from 2024.[145]

143 The analysis is based on cells from H164 to H166 of 'BengaRiver', 'Zambeze', 'EL945L' tabs of '2010.11.23_Acquistion Model_RT_00074485.xlsx' for Acquisition Model.
For Business Unit Models, the analysis is based on rows 401 to 410 of multiple mining calculation tabs of 'Defendant's Exhibit 42 (Native).xlsx' and rows 407 to 416 of 'RT_SEC_00295084.xlsx' (November BU Model).

144 $40.6/t = 580km x 7cent per km per Product tonne.
Defendant's Exhibit 42 (Native).xlsx, 'Benga Phase 1 Calcs' tab, rows 71 and 145.

145 $4.15/t = 500km * 0.83 cent per km per Product tonne.
Defendant's Exhibit 42 (Native).xlsx, 'Benga Phase 1 Calcs' tab, rows 72 and 146.

4.23 The Brisbane Model assumes that port charges at the Beira Port, which is connected to the Sena-Biera rail line, is \$5.2/t in 2012 and is assumed to increase to \$10.2/t in 2017 and remains constant thereafter. The Qualimane Port, which is the terminal of the greenfield railway, was assumed to cost \$3/t from 2018. This charge decreases to \$1.9/t in 2014.[146]

4.24 In the Brisbane Model, the sum of the greenfield rail opex of \$4.15/t and the Qualimane port opex of \$1.9/t is (\$6.05/t) which accounts for most of the logistic opex per tonne (\$7.00/t).

4.25 In the November BU Model, which was used for the impairment test in November 2012, the Sena-Biera rail costs are assumed to start with \$49.9/t product[147] in 2012 and stabilized at \$28.4/t product in 2017.[148] The greenfield railway charges were \$9.6/t product at the start of operations in 2019,[149] and the cost decreased to \$4.6/t product in 2023.[150]

4.26 Port charges at Beira Port ranged from \$6.3/t to \$8.6/t with the latter being the long-term cost. The Qualimane Port charges decreased from \$4.9/t to \$4.6/t in 2022.[151]

4.27 In the November BU model, a small portion of product (less than total 1Mt) from Benga Phase 1 operation is assumed to be transported by road at \$40.0/t Product.[152]

4.28 Similar to the Brisbane Model, the sum of both long-term prices of \$4.6/t from the greenfield railway opex and the Qualimane opex of \$4.6/t explains \$9.2/t of the average logistic opex per tonne of saleable product of \$10.0/t.

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146 Defendant's Exhibit 42 (Native).xlsx, 'Benga Phase 1 Calcs' tab, rows 151 and 152.

147 \$49.9/t product = 580km x 8.6 cent per km per product tonne.
RT_SEC_00295084.xlsx (November BU Model), 'Benga Phase 1 Calcs' tab, rows 71 and 151.

148 \$28.4/t product = 580km x 4.9 cent per km per Product tonne.
RT_SEC_00295084.xlsx (November BU Model), 'Benga Phase 1 Calcs' tab, row 71 and cell H151.

149 \$9.6/t product = 533km x 1.8 cent per km per product tonne.
RT_SEC_00295084.xlsx (November BU Model), 'Benga Phase 1 Calcs' tab, row 72 and cell J152.

150 \$4.6/t product = 533km x 0.86 cent per km per product tonne.
RT_SEC_00295084.xlsx (November BU Model), 'Benga Phase 1 Calcs' tab, row 72 and cell N152.

151 RT_SEC_00295084.xlsx (November BU Model), 'Benga Phase 1 Calcs' tab, rows 157 and 158.

152 \$40/t product = 600km x 6.7 cent per km per product tonne.
RT_SEC_00295084.xlsx (November BU Model), 'Benga Phase 1 Calcs' tab, rows 75 and 155.

Capital Expenses

Figure 4.8: Comparison of Expansion Capital Investments by DCF model[153]

(100% basis)	Acquisition Model	Brisbane Model	November BU Model
ROM (Mt) (a)	2,135	5,905	3,138
Product (Mt) (b)	903	2,220	1,045
CAPEX (US$ millions) (c)	**6,689**	**17,539**	**17,025**
Logistics CAPEX (d)	630	7,812	8,556
Other CAPEX (e)	6,059	9,727	8,469
CAPEX per ROM ($/t) (c/a)	*3*	*3*	*5*
Logistics CAPEX per ROM ($/t) (d/a)	*0*	*1*	*3*
Other CAPEX per ROM ($/t) (e/a)	*3*	*2*	*3*
CAPEX per Product ($/t) (c/b)	*7*	*8*	*16*
Logistics CAPEX per Product ($/t) (d/b)	*1*	*4*	*8*
Other CAPEX per Product ($/t) (e/b)	*7*	*4*	*8*

4.29 For the initial capex, I have again separated the logistics related capex from the other capital costs. In the Acquisition Model, I included the capex items, 'River Dredging – for initial barging', 'Channel Dredging – for port development', and 'Chinde Port Development' items as logistics capex. From both Business Unit Models, I included the capex items, 'Rail Infra' and 'Port Infra' to calculate the logistics capex.

4.30 In the Acquisition Model, logistics related capex totalled $630 million out of total capex of $6,689 million (undiscounted), which constitutes 9% of total capex. In the Acquisition Model, the barging option is estimated to reach a maximum capacity of 32 Mtpa. However, the logistics related capex is relatively low. Rio Tinto's cost assumptions were based on a conceptual cost estimation report for the barging option as of August 2010 with an error range of +/-50%.[154]

4.31 In the Acquisition Model, $630 million in logistics related capex was made up of three items, excluding the river fleet:[155]

i) River Dredging for initial barging: $150 million

ii) Channel Dredging for port development: $155 million

iii) Chinde Port Development: $325 million

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153 Expansion capex excludes 'Sustaining capex' and 'Closure Costs / Rehabilitation'. The analysis is based on cells from H228 to H248 of 'BengaRiver', 'Zambeze', 'EL945L' tabs of '2010.11.23_Acquistion Model_RT_00074485.xlsx' for Acquisition Model. For Business Unit Models, the analysis is based on cells from B421 to B430 of multiple mining calculation tabs of 'Defendant's Exhibit 42 (Native).xlsx' and cells from B427 to B436 of 'RT_SEC_00295084.xlsx' (November BU Model).

154 Project Ralph Feasibility Opinion and Conceptual Cost Estimation, August 16th, 2010. [RT_SEC_00083654]

155 Cells from H241 to H243 of 'BengaRiver', 'Zambeze', 'EL945L' tabs of '2010.11.23_Acquistion Model_RT_00074485.xlsx'

4.32 In the Brisbane Model and the November BU Model, logistics related capex sums to $7.8 billion and $8.6 billion, respectively, accounting for 45% and 50% of the respective totals. They include greenfield rail and port infrastructure investments.

4.33 When the logistics capex is considered on a per tonne produced basis over the life of the mine, the logistics capex makes up approximately $0.70/t, $3.52/t, and $8.19/t for the Acquisition Model, Brisbane Model, and November BU Model, respectively.

4.34 Since the components of and assumptions for opex and capex may differ across the models, I have also provided a comparison of the combined logistics opex and capex per tonne produced, in the figure below.

Figure 4.9: Logistics opex and capex per tonne produced, by model[156]

(100% basis and undiscounted)	Acquisition Model	Brisbane Model	November BU Model
Product (Mt)	903	2,220	1,045
Logistics OPEX & CAPEX per Product ($/t)	**15**	**10**	**18**
Logistics OPEX per Product	14	7	10
Logistics Expansion CAPEX per Product	1	4	8

Figure 4.10: Total opex and capex per tonne produced, by model[157]

(100% basis and undiscounted)	Acquisition Model	Brisbane Model	November BU Model
Total OPEX & CAPEX per Product ($/t)	**64**	**79**	**97**
OPEX per Product	53	67	75
Expansion CAPEX per Product	7	8	16
Sustaining CAPEX per Product	4	5	5
Closure Cost per Product	0.3	0.2	0.8

4.35 On an undiscounted basis, if all the opex, expansion capex, sustaining capex, and closure cost for the life of mine are considered, the Acquisition Model assumes $64/t produced (both coking and thermal coal). The equivalent figures from the Brisbane Model and the November BU Model are $79/t and $97/t, respectively. These figures do not consider royalty and corporate taxes.

4.36 Since the price of coking coal is relatively higher than that of thermal coal, the ratio of coking to thermal coal for each tonne mined has a significant impact on the fair market value of the RTCM Projects. I have provided a summary of the ratio across the three reference DCF models in the following figure.

156 Summary from Figure 4.7 and Figure 4.8.

157 In addition to Figure 4.7 and Figure 4.8, the analysis is based on cells H263 and H264 of 'BengaRiver', 'Zambeze', 'EL945L' tabs of "2010.11.23_Acquistion Model_RT_00074485" for Acquisition Model. For Business Unit Models, the analysis is based on cells B418 and B434 of multiple mining calculation tabs of Defendant's Exhibit 42 (Native) and cells B424 and B440 of RT_SEC_00295084.xlsx (November BU Model).

Figure 4.11: Average ratio of coking to thermal coal and NPV of the financial models[158]

(US$ millions)	Acquisition Model	Brisbane Model	November BU Model
Coking : Thermal coal ratio	62 : 38	44 : 56	42 : 58
NPV (100% basis)	4,311	(680)	5,317
NPV (RT share basis)	3,685	(987)	4,338

4.37 As presented in Figure 4.11, the ratio between coking coal and thermal coal decreased significantly from November 2010 (Acquisition Model) to November 2012 (November BU Model). All else equal, the decrease in this ratio would have a significant negative impact on the value. However, a higher NPV (+$5.3 billion, 100% basis) was estimated in November 2012 than that estimated (+$4.3. billion, 100% basis) in November 2010, due to offsetting positive factors.

4.38 One of the key parameters that caused the increase of NPV in the November BU Model relative to the earlier models, in spite of the increasing opex and capex unit cost and deteriorating mix ratio between coking and thermal coals, is the forecasted coal price assumptions.

4.39 Rio Tinto uses internal price forecasts of commodity prices (PEG Price) for impairment testing purposes.[159] In the 2011 Annual Report, Rio Tinto explains that price forecasts assume that *"short term market prices will revert to the Group's assessment of the long term price, generally over a period of three to five years."*[160]

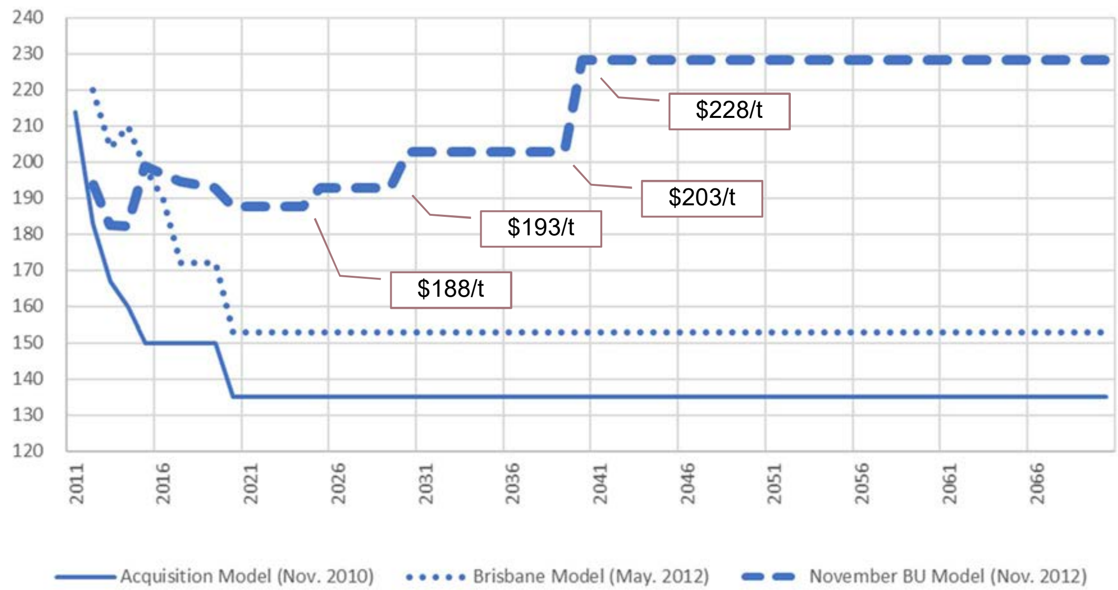
4.40 The figure below provides an illustration of the assumed price forecasts for coal used in the three main models (i.e. Acquisition Model, Brisbane Model and November BU Model). These are standard benchmark prices before any coal quality adjustments. Despite the fact that the previous PEG price forecasts for November 2010 and February 2012 were for 10-year periods, after which time the price was held constant, the long-term price estimation in November BU Model continues to significantly increase in real terms beyond year 10. I have not been provided with the PEG reports for these periods to determine whether they agree to the prices used in the various models.

158 The analysis is based on cells from H47 to H54 of 'BengaRiver', 'Zambeze', 'EL945L' tabs of '2010.11.23_Acquistion Model_RT_00074485.xlsx' for Acquisition Model.For Business Unit Models, the analysis is based on rows 377 to 380 of multiple mining calculation tabs of 'Defendant's Exhibit 42 (Native).xlsx' and rows 383 to 386 of 'RT_SEC_00295084.xlsx' (November BU Model).

159 Rio Tinto 2011 Annual Report, page 143.

160 Rio Tinto 2011 Annual Report, page 143.

Figure 4.13: Price assumptions by financial models (coking coal, $/t)[161]



161 The analysis is based on row 40 of 'Assumptions' tab of '2010.11.23_Acquistion Model_RT_00074485.xlsx' for Acquisition Model.
For Business Unit Models, the analysis is based on row 65 of 'Global Inputs' tab of 'Defendant's Exhibit 42 (Native).xlsx' and 'RT_SEC_00295084.xlsx' (November BU Model).

5. OPINIONS – ASSUMING THE BARGING OPTION WAS NOT VIABLE IN LATE 2011 OR MID-2012

A. Issue 1) Assume the barging option was not viable as of late 2011

5.1 Under the assumption that as of late 2011(i.e. November to December) it was determined that the barging option modelled in the Acquisition Model was no longer a viable option for the RTCM Projects, it is my opinion that the Acquisition Model <u>would not</u> have provided a reliable measure of the FMV of the RTCM Projects from that point in time onward.

5.2 The Acquisition Model conclusions were premised on the assumption that 96.5% of the total production from the three coal projects acquired from Riversdale would have been transported via barging to the port.[162]

5.3 Although the Acquisition Model did provide a 'BengaRail" option,[163] this option assumed that the coal from Benga would have been shipped over the existing Sena-Biera railway line, with an assumed expansion. The greenfield rail and port scenario that Rio Tinto considered would have been required to develop all three mines, including Zambeze and East Tete is not contemplated in the Acquisition Model. That is, the architecture of the Acquisition Model did not allow for the determination of value under a non-barging option for the Zambeze or Tete East projects.

5.4 In addition, a number of the key inputs required to value all three RTCM projects under a non-barging option were not included in the Acquisition Model:

i) the estimated costs for the infrastructure operating expenditures and capital expenditures would have needed to be re-estimated;

ii) The assumed production schedule would have needed to be redone;

162 'Zambeze', 'BengaRiver' and 'EL945' tabs of '2010.11.23_Acquistion Model_RT_00074485.xlsx'. Calculated as 31.9 million tonnes of production from Benga to be transported by rail out of total production of 903 million tonnes from Benga, Zambeze and EL945 from the Acquisition Model.

163 An alternative was modelled for Benga in the 'BengaRail' tab. This tab assumed that 100% of the coal be transported by rail to the Biera port and provided an NPV of approximately $1.3 billion as compared to 'BengaRiver' which provided an NPV of approximately $1.8 billion, approximately a 28% reduction in value. Only the 'BengaRiver' NPV was included in the conclusions in the 'Summary' tab of the Acquisition Model.

iii) The JORC Resource estimates would have needed to be redone. I understand that Riversdale's Reserves and Resource estimates under JORC for Benga and Zambeze were based on a barging assumption including the estimated operating and capital costs for a barging option. According to Mr. Woodley of Rio Tinto, if the Benga and Zambeze Resource statements had been redone assuming barging was no longer an option, *"[T]he remaining resource/reserve as presented there would decrease further."*[164]

iv) For the purposes of an FMV determination, the level of operational and execution risk included in the discount rate applied to a barging scenario and would need to be revisited in a non-barging scenario at that time; and,

v) To determine the FMV of the RTCM Projects at the end of 2011, all market-based assumptions/inputs such as coal price forecast, operating and capital costs, inflation rates, and the applicable discount rate would need to be updated to the specific date. While the Acquisition Model design did allow for this, the Acquisition Model was not updated for changes in these inputs as of the end of 2011, in any of the iterations that I reviewed.

B. Issue 2) Assume the barging option was not viable as of mid-2012

5.5 Under the assumption that it was determined that the barging option modelled in the Acquisition Model was no longer viable as of mid-2012 (i.e. June to July 2012), it is my opinion that the Acquisition Model would not have provided a reliable measure of the FMV of the RTCM Projects from that point in time onward.

5.6 In addition to the reasons provided above in issue 1), as of mid-2012 there were a number of important reported developments that materially impacted the manner in which the RTCM Projects would have been developed, and which would have materially impacted the FMV of the projects from the date of these developments onward.

5.7 Based on the documents that I understand were presented at, or were available for presentation at the May 2012 Brisbane Meeting, the following circumstances had changed since the Acquisition Date:

i) Whereas the Acquisition Model was based on a barging transportation solution, due to the rejection of the barging proposal by Mozambique it was determined that *"[g]reenfield rail & port development is the only way of delivering substantially higher transport capacity at competitive cost. The earliest a solution could be in place would be 2018"*;[165]

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164 Deposition of Andrew Woodley, dated April 12, 2016, page 69-70.

165 Rio Tinto presentation, "Rio Tinto Coal Mozambique Business Review: Brisbane" dated May 11, 2012, page 5.

ii) The Sena-Biera rail line was the only operational coal export infrastructure and it had a nameplate capacity of 6 Mtpa as at May 2012 and was shared between Rio (32%) and Vale (68%).[166] Thus, RTCM's share was approximately 2ds Mtpa. The Acquisition Model assumed that up to 10 Mtpa in rail capacity was available to RTCM;[167]

iii) Total rail capacity was unlikely to exceed 10 Mtpa by 2018 and *"would be at a high cost*". [168] In the Acquisition Model, total production was assumed to exceed 10 Mtpa by 2014 and was assumed to be 27.2 million tonnes in 2018;[169]

iv) Due to project delays and rail line capacity constraints, RTCM expected to ship its first coal exports from Benga at the end of May 2012, with a total export for 2012 of approximately 0.5 million tonnes of coking coal.[170] The Acquisition Model assumed 2.94 million tonnes of coking coal would have been exported by the end of 2012;[171]

v) The earliest possible production for Zambeze was anticipated to be in 2016 (vs. 2015 in the Acquisition Model); [172]

vi) The coking coal to thermal coal ratios for Benga and Zambeze had reduced as follows:[173]

(1) Benga: 60%/40% (as compared with 66%/44% anticipated at acquisition); and,

(2) Zambeze: 55%/45% (as compared with 59%/41% anticipated at acquisition);

vii) The resource characteristics had changed significantly for Benga and Zambeze in May 2012 as compared to at the Acquisition Date in April 2011, as outlined in the figure below.

166 Rio Tinto presentation, "Rio Tinto Coal Mozambique Business Review: Brisbane" dated May 11, 2012, page 5.

167 '2010.11.23_Acquistion Model_RT_00074485.xlsx', 'Logistics' tab..

168 Rio Tinto presentation, "Rio Tinto Coal Mozambique Business Review: Brisbane" dated May 11, 2012, page 15.

169 '2010.11.23_Acquistion Model_RT_00074485.xlsx' 'Zambeze', 'BengaRiver' and 'EL945' tabs of.

170 Rio Tinto presentation, "Rio Tinto Coal Mozambique Business Review: Brisbane" dated May 11, 2012, page 9.

171 '2010.11.23_Acquistion Model_RT_00074485.xlsx', 'BengaRiver' tab of .

172 Rio Tinto presentation, "Rio Tinto Coal Mozambique Business Review: Brisbane" dated May 11, 2012, page 10.

173 Rio Tinto presentation, "Rio Tinto Coal Mozambique Business Review: Brisbane" dated May 11, 2012, page 16. Note: page 9 of the same presentation states that the Benga coking coal ratio was estimated at 50%, and not 60% as per page 16.

Figure 5.1: Changes in Resource Characteristics[174]

Benga	Current	Bid
Total overburden	5.2Bt	3.9Bt
Total run-of-mine (ROM) coal	532Mt	453Mt
Strip ratio	3.3 - 4.1	3.6
Product yield	45%	47%
Total saleable products	240Mt	215Mt
• Coking coal	60%	66%
• Thermal coal	40%	34%
Price penalties		
• Coking coal	2.5%	0%
• Thermal coal	25%	30%
Life-of-mine	38 years	32 years

Zambeze	Current	Bid
Total overburden	14.2Bt	10.1Bt
Total run-of-mine (ROM) coal	1.6Bt	1.5Bt
Strip ratio target	3.5	2.7
Product yield	36%	38%
Total saleable products	551Mt	583Mt
• Coking coal	55%	61%
• Thermal coal	45%	39%
Price penalties		
• Coking coal	8%	4%
• Thermal coal	25%	30%
Life-of-mine	54 years	35 years

viii) Total operating expenditures for all projects were higher than anticipated at acquisition.[175]

5.8 Given these reported developments, in order to provide a reliable measure of the FMV of the RTCM Projects as of mid-2012, the Acquisition Model would have needed to be updated to reflect each of these factors to provide a forecast of the expected future cash flow that the RTCM Projects would have generated over their respective life of mine. Although some of these factors could have been updated in the Acquisition Model, as noted, it did not have the functionality to incorporate the most significant adjustment being the change from a barging operation to the greenfield rail and port operation that was referred to at the May Brisbane Meeting as the only option Rio Tinto had to deliver "*…substantially higher transport capacity at competitive cost".*[176]

174 Rio Tinto presentation, "Rio Tinto Coal Mozambique Business Review: Brisbane" dated May 11, 2012, page 16.

175 Rio Tinto presentation, "Rio Tinto Coal Mozambique Business Review: Brisbane" dated May 11, 2012, pages 18 and 19.

176 Rio Tinto presentation, "Rio Tinto Coal Mozambique Business Review: Brisbane" dated May 11, 2012, page 5.

5.9 Thus, it is my opinion that the Acquisition Model, as it existed as of mid-2012 (without a significant re-design of its functionality), had not been, and could not have been adjusted to provide a value that reflected the updated project parameters at that date, if barging was no longer a viable option at that point in time (or thereafter).

5.10 It is also my opinion that the Business Unit Models which RTCM had prepared in 2012 had the necessary functionality to provide a reliable measure of the FMV of the RTCM Projects as of mid-2012 (and thereafter), assuming it was populated with the appropriate inputs, in a manner consistent with accepted international mineral valuation standards and guidelines.

6. EXPERT DECLARATION

6.1 I understand that my duty in giving evidence in this litigation is to assist the trier of fact to decide the issues in respect of which expert evidence is adduced. I have complied with, and will continue to comply with, that duty.

6.2 I confirm that this is my own, impartial, objective, unbiased view.

6.3 I confirm that all matters upon which I have expressed an opinion are within my area of expertise.

6.4 I confirm that, at the time of providing this written opinion, I consider it to be complete and accurate and constitute my true, professional opinion.

6.5 I confirm that if, in the course of this litigation, I consider this opinion requires any correction, modification or qualification I will notify the parties to this litigation and the trier of fact forthwith.

Chris Milburn

Chris Milburn December 20, 2019

APPENDIX 1 SCOPE OF REVIEW

A1.1 My opinion is based on my review of the following information.

A1.2 **Information Provided to Secretariat**

- Iterations of Rio Tinto's DCF models for the RTCM Projects from October 2010 to February 2013 including:
  - i) The Acquisition Model, "2010.11.23_Acquistion Model_RT_00074485.xlsx"
  - ii) The Brisbane Model, "Defendants' Exhibit 42 (Native).xlsx"
  - iii) The November BU Model, "RT_SEC_00295084.xlsx"
- A paper from Dan Larsen, Group Controller, "Rio Tinto Audit Committee Meeting 26 November 2012 Review of Carrying Values". [RT_00000331]
- Deposition of Andrew Woodley, dated April 12, 2016.
- Deposition of Mr. Morris dated November 8, 2018.
- Project Ralph Feasibility Opinion and Conceptual Cost Estimation, August 18th, 2010. [RT_SEC_00083654]
- Rio Tinto Board Meeting Paper on the Acquisition of Riversdale Mining Limited dated December 16, 2010. [RT_00017283]
- Rio Tinto Coal Mozambique, "Business Review", dated May 2012". [RT_00241218]
- Rio Tinto Controller's Paper dated June 18, 2012. [RT_00000240]
- Rio Tinto internal memorandum, "Rio Tinto Coal Mozambique Impairment Valuation – Updated" dated January 11, 2013. [RT_00000380].
- Rio Tinto presentation, "Project Ralph: Board Meeting – 16 December 2010". [RT_00010760]
- Rio Tinto presentation, "Rio Tinto Coal Mozambique Business Review: Brisbane" dated May 11, 2012.
- Rio Tinto Technology and Innovation, Project Ralph Technical Due Diligence, dated January 7, 2011. [RT_00350519]
- SEC Complaint dated October 17, 2017.

A1.3 Secretariat Documents

1. CICBV, "Practice Bulletin No. 2 – International Glossary of Business Valuation Terms", 2001. [SI-1]
2. US Geological Survey, How do we extract minerals? [SI-2]
3. "Introductory Mining Engineering", Hartman, H. L., & Mutmansky, J. M., 2002. [SI-3]
4. World Coal Association, Uses of Coal. [SI-4]
5. World Coal Association, What is Coal. [SI-5]
6. Kentucky Geological Survey, Coalification [SI-6]
7. US Geological Survey, What are the types of coal? [SI-7]
8. World Coal Association, Types of Coal. [SI-8]
9. International Energy Agency, Coal Medium-Term Market Report, 2012. [SI-9]
10. Kentucky Geological Survey, Calorific Value. [SI-10]
11. Kentucky Geological Survey, Moisture in Coal. [SI-11]
12. Kentucky Geological Survey, Volatile Matter. [SI-12]
13. Kentucky Geological Survey, Ash. [SI-13]
14. Kentucky Geological Survey, Fixed Carbon. [SI-14]
15. Kentucky Geological Survey, Steam Coal. [SI-15]
16. Ram River Coal Corp. "Metallurgical Coals". [SI-16]
17. World Coal Association, Coal Electricity. [SI-17]
18. World Coal Association, Coal Mining. [SI-18]
19. U.S. Energy Information Administration (EIA), Coal Mining and Transportation. [SI-19]
20. World Coal Association, Where is Coal found. [SI-20]
21. World Coal Association, Coal Facts, 2012. [SI-21]
22. World Coal Association, Coal & Steel Facts, 2012. [SI-22]
23. International Energy Agency, Coal Medium-Term Market Report, 2013. [SI-23]
24. "Business Valuation", Howard E Johnson, page xlix. [SI-24]
25. Merriam-Webster dictionary, "Value". [SI-25]
26. "Damodaran on Valuation" 2nd Edition, Aswath Damodaran. [SI-26]
27. "CRIRSCO", Canadian Institute of Mining, Metallurgy and Petroleum. [SI-27]
28. Rio Tinto, 2012 Annual Report. [SI-28]
29. JORC Code 2012, The Australasian Institute of Mining and Metallurgy. [SI-29]

30. Rio Tinto, 2018 Annual Report. [SI-30]

31. CIMVAL, "Standards and Guidelines for Valuation of Mineral Properties", February 2003. [SI-31]

32. SAMVAL Code 2016. [SI-32]

33. VALMIN Code 2015. [SI-33]

34. SME Standards and Guidelines for the Valuation of Mineral Properties, 2017. [SI-34]

35. International Mineral Property Valuation Standards (IMVAL) Template, May 2018. [SI-35]

36. Rio Tinto 2011 Annual Report. [SI-36]

37. "Mine Rehabilitation and Closure Cost", Richard Humphries dated July 2016. [SI-37]

38. Mozambique Mining Law No 20, Article 44(2)(p), dated August 18, 2014. [SI-38]

39. "Valuing a Business: The Analysis and Appraisal of Closely Held Companies, Fifth Edition" Shannon P. Pratt. [SI-39]

40. William E. Roscoe, RPA, Mineral Appraisal Meeting, Denver, 1-3, October 2003. [SI-40]

41. "Applying the Cost Approach to Valuation of Exploration Stage Mineral Assets", André J van der Merwe, January 2017. [SI-41]

42. "Valuation 4: Cost Approach", Larry Smith. [SI-42]

43. Information from incotermsexplained.com [SI-43]

APPENDIX 2 CURRICULUM VITAE OF CHRIS MILBURN

Professional Experience

I am a managing director at Secretariat International and is based in Toronto. I am a Chartered Professional Accountant, Certified Management Accountant (CPA/CMA), a Chartered Business Valuator (CBV) and am a Qualified Valuator under the Canadian Institute of Mining's Valuation Standards and Guidelines (CIMVAL).

I have over 20 years of experience in the quantification of economic damages and the valuation of business interests and forensic/financial investigations in the context of international arbitrations, commercial litigation, insurance litigation, personal injury litigation, tax litigation, and consulting for internal business purposes.

My work experience includes hundreds of matters relating to assets and business interests on every continent and involving billions of dollars in dispute across many industries including mining, oil and gas, energy, financial services, investment banking, asset management, manufacturing, textiles, software, and pharmaceuticals.

I have provided expert testimony relating to valuation and economic damages issues numerous times including in international arbitration cases heard at the World Bank in Washington D.C., the World Bank in Paris, the New York International Arbitration Centre, Maxwell Chambers in Singapore and Arbitration Place in Toronto.

I have been recognized as a leading expert in the field of damages and valuation in the International Who's Who of Arbitration Expert Witnesses by Who's Who Legal since 2014. I have also been recognized as one of the leading arbitration expert witnesses in Canada in Who's Who Legal Canada since its inception in 2015 and has been named to the list of top mining experts in 2019, the first year the mining list has included experts.

I also speak regularly on damage quantification and valuation issues and have been involved in the education and training of professional valuators as well as advocacy training programs for lawyers for many years.

Representative Engagements

- Valuation of mineral project and quantification of damages in a treaty dispute under ICSID, regarding an iron ore project in West Africa. Prepared expert reports including a valuation of the Claimant's investment, and testified at the hearing. Matter resolved;
- Valuation of mineral project and quantification of damages in a treaty case under UNCITRAL rules related to a silver, lead, and zinc project in South America. Prepared expert reports quantifying damages to the claimant and testified at the hearing. Matter resolved;
- Valuation of mineral projects and quantification of damages in a treaty case under UNCITRAL rules related to a silver, indium and gallium project in South America. Prepared expert reports and testified at the hearing. Matter resolved;
- Valuation of mineral project and quantification of damages in a treaty case under UNCITRAL rules related to a copper, silver, and molybdenum project in South America. Prepared expert report quantifying damages to the claimant and testified at the hearing. Matter resolved;
- Valuation and quantification of economic damages related in a NAFTA dispute related to the alleged expropriation of a natural gas concession. Prepared expert reports including a valuation of the natural gas rights at issue, and testified at the hearing. Decision pending;
- Valuation of mineral project and quantification of damages in a commercial arbitration related to a lithium, tin and coltan project in Africa. Prepared expert report quantifying damages to the claimant. Matter ongoing;
- Valuation of mineral project and quantification of damages in a treaty case under UNCITRAL rules related to a gold project in Asia. Prepared expert report quantifying damages to the claimant. Matter ongoing;
- Valuation of a holding company with numerous mining and petroleum assets in West Africa including a manganese project, an iron ore mine, and offshore oil and gas assets. Prepared expert reports on valuation and economic damages issues. Matter is ongoing;
- Valuation of mineral project and quantification of damages in a treaty case under the ICSID rules related to a gold project in Central America. Prepared expert reports on valuation and economic damages. Matter is ongoing;
- Quantification of lost profits and other economic damages due to business interruption following a fire at an iron ore mine in Australia. Matter ongoing;
- Valuation of mineral projects in the US relating to a producing palladium group metals project in a matter before the Delaware courts. Prepared expert reports. Decision pending;
- Valuation of a mineral property in the US relating to a former producing iron ore project in a matter before the Bankruptcy Court of the State of Utah. Prepared expert reports. Decision pending;

» Valuation of mineral project and quantification of damages in a treaty case under UNCITRAL rules regarding a gold project in Western Europe. Prepared expert reports and attended the hearing. Decision pending;

» Quantification of damages in treaty arbitration under ICSID relating to the alleged expropriation of a metallurgical processing facility in South America. Prepared reports quantifying damages to the Claimants and attended the hearing at the World Bank in Paris. Matter resolved;

» Valuation of mineral project and quantification of damages in a treaty dispute under ICSID, regarding a bituminous thermal coal project in Asia. Prepared expert report quantifying damages to the claimant. Matter resolved;

» Assessment of damages claims in an International Chamber of Commerce (ICC) arbitration related to the contract mining costs of a zinc, lead and silver mine in South America. Prepared expert report and reply reports and attended hearing. Matter resolved;

» Valuation of mineral concessions and quantification of economic damages in a dispute before the Ontario Mining Commissioner relating to exploration stage gold mineral concessions in Northern Ontario. Matter resolved;

» Quantification of damages in an ICC case related to an iron ore mining project in Western Africa: Managed multi-discipline project team including iron ore economists, corporate finance experts, mining engineers, and geologists, prepared expert reports and attended hearing. Matter resolved;

» Quantification of damages in a commercial dispute under the British Columbia International Commercial Arbitration Act involving a large copper and gold deposit in Asia: Managed project team and prepared expert report calculating damages to the claimant and attended the hearing. Matter resolved;

» Quantification of damages in an ICC treaty dispute related to a copper/cobalt mining project in Africa: Managed project team in the preparation of a critique report of the claimant's expert report in an investor-state dispute under the ICC. Prepared expert report. Matter resolved;

» Valuation of gold mineral projects for two exploration and development companies with interests in South America prior to nationalization. Matters resolved; and,

» Consulting project analyzing the level of "government take" applicable to a potash and phosphate rock mining company in the Middle East relative to comparable companies and other countries in connection with a government review of mineral tax policies. Matter resolved.

Education/Professional Designations

- Chartered Business Valuator (CBV) – 2004
- Chartered Professional Accountant (CPA)/Certified Management Accountant (CMA) – 2000
- B.A. (Economics) at the University of Western Ontario – 1992

Positions Held

- Managing Director, Secretariat International – December 2018 to Present
- Managing Director, FTI Consulting Canada ULC – April 2009 to December 2018
- Senior Managing Consultant, LECG Canada Ltd. – April 2007 to March 2009
- Senior Consultant, LECG Canada Ltd. – March 2004 to March 2007
- Senior Consultant, Low Rosen Taylor Soriano – May 2001 to April 2004
- Consultant, Low Rosen Taylor Soriano – April 1998 to April 2001
- Consultant, Arthur Anderson – April 1997 to March 1998

Testimony (2016-2019 inclusive)

1. Infinito Gold Ltd. v. Costa Rica, International Centre for Settlement of Investment Disputes (ICSID) Arbitration, hearing held in July 2019. Confidential

2. Tamagot Bumi S.A. and Bumi Mauritania S.A. v. Islamic Republic of Mauritania. ICSID Arbitration. Hearing held in April 2017. Confidential.

3. Bear Creek Mining Corporation v. Republic of Peru. ICSID Arbitration. Hearing held in September 2016. Documents are in the public domain.

4. South American Silver Limited v. Bolivia. Permanent Court of Arbitration (PCA) case. Hearing held in July 2016. Confidential.

5. Lone Pine Resources Inc. v. Government of Canada, NAFTA Arbitration. Hearing held in October 2017. Documents are in the public domain.

Publications and Presentations (2010 to 2019 inclusive)

- “The Valuation of Mineral Properties in Arbitration Disputes”, Arbitration Place Quarterly Newsletter, Summer 2013.

- Co-author, “Valuation of “Start-Up Oil and Gas and Mining Projects”. Global Arbitration Review, the Arbitration Review of the Americas 2011.

- Speaker at Canadian Council of International Law (CCIL) "NAFTA Chapter 11 Looking forward while glancing backward", October 2019. (No materials published)

- Speaker at Latin Lawyer – GAR Live’s 3rd Annual Arbitration Summit, “Mining and metals: investment and the environment”, April 2019. (No materials published)

- Speaker at event held during the Prospector’s & Developers Association of Canada (“PDAC”) Conference in March 2018 and 2019, “Trends in Mining Disputes”. (No materials published)

- Speaker at event held during the PDAC Conference in March 2017, “Mining Disputes: Lessons and Best Practices”. (No materials published)

- Speaker at the Expert Witness Forum, held in Toronto in March 2017, “The Use of Expert Evidence in International Arbitration”. (No materials published)

» Speaker at event held during PDAC Conference in March 2016, "Technical and Economic Considerations for NI 43-101 Compliant Technical Reports". (No materials published)

» Speaker at event held during the PDAC Conference in March 2015, "Evidentiary Issues in Presenting a Mining Claim" and "Economic Damage and Technical Issues Faced in Mining Disputes". (No materials published)

» Speaker at event held during the PDAC Conference in March 2014, "Assessing Risks in New Mining Ventures" and "Use of Technical Reports to Assess Value". (No materials published)

» Speaker at CPA Conference on Financial Reporting Conference for the Mining Industry, "Disclosure of Financial and Economic Information under National Instrument 43-101", December 2013. (No materials published).

Other

» Developed course materials for and acted as an expert witness in mock hearings for the FIAA Expert Witness Trial Practice Programs held in Lausanne Switzerland in 2008-2009, Paris in 2011, New York in 2014 and Washington DC in 2015.

» Authored course materials for the Canadian Institute of Chartered Business Valuators

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UNITED STATES DISTRICT COURT
SOUTHERN DISTRICT OF NEW YORK

SECURITIES AND EXCHANGE COMMISSION, Plaintiff,

vs.

RIO TINTO PLC, RIO TINTO LIMITED, THOMAS ALBANESE, and GUY ROBERT ELLIOTT, Defendants.

Case No. 1:17-cv-7994 (AT)(DCF)

VIDEOTAPED DEPOSITION OF ALBERT DIEDERICH METZ
Via Videoconference
Cornwall-on-Hudson, New York
Wednesday, June 17, 2020

Reported by:
KRISTIN KOCH, RPR, RMR, CRR
JOB NO. 180651

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June 17, 2020
9:36 a.m.

Videotaped Deposition of ALBERT DIEDERICH METZ, Via Videoconference, before Kristin Koch, a Registered Professional Reporter, Registered Merit Reporter, Certified Realtime Reporter and Notary Public of the State of New York.

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A P P E A R A N C E S: (Via Videoconference)

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A P P E A R A N C E S: (Continued)

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A P P E A R A N C E S: (Continued)

ALSO PRESENT:

PHIL RIZZUTI, Legal Video Specialist

TOM ALBANESE
EUGENE CANJELS
GREG MILLER
KEVIN GOLD
MAME MALONEY
JEREMY MARMER

THE VIDEOGRAPHER: Good morning, counsel. My name is Phil Rizzuti. I am a legal videographer in association with TSG Reporting, Inc.

Due to the severity of the COVID-19 and following the practice of social distancing, I will not be in the same room with the witness. Instead, I will record this videotaped deposition remotely. The court reporter, Kristin Koch, also will not be in the same room and will swear the witness remotely.

Do all parties stipulate to the validly of this video recording and remote swearing and that it will be admissible in the courtroom as if it had been taken following Rule 30 of the Federal Rules of Civil Procedure and the state's rules where this case is pending?

MR. BEDNAR: Yes for the SEC.

MR. WEITZMAN: On behalf of Rio Tinto, we do.

MR. CHEPIGA: Yes on behalf of Mr. Elliot.

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MS. VALLETTE: Yes on behalf of Mr. Albanese.

THE VIDEOGRAPHER: Okay. This is the start of media labeled number 1 of the video-recorded deposition of Mr. Albert Metz in the matter of the Securities and Exchange Commission versus Rio Tinto PLC, et al., in the United States District Court for the Southern District of New York, case number 1:17-cv-7994.

This deposition is being held on June 17, 2020, at approximately 9:36 a.m.

My name is Phil Rizzuti. I am the legal video specialist from TSG Reporting, Inc. The court reporter is Kristin Koch in association with TSG Reporting.

Counsels' appearances have already been noted on the record by the court reporter.

Will the court reporter, please, swear in the witness.

THE COURT REPORTER: Before I swear in the witness, from the Securites and Exchange Commission did we get an

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agreement?

MR. BEDNAR: Yes, I said yes on behalf of the SEC.

THE COURT REPORTER: Thank you.

MR. BEDNAR: Thank you.

(Witness was sworn.)

MR. WEITZMAN: I think I got booted again. I apologize. I'm fine -- I am trying to log back in -- without video for now questioning, if that's acceptable to

the witness and to the SEC.
MR. BEDNAR: I think it really depends on whether Dr. Metz is able to understand you without also seeing you.
Ms. Koch, does that create problems for you if you are not able to see Mr. Weitzman?
THE COURT REPORTER: No.
MR. BEDNAR: Okay. Dr. Metz, if you are having trouble understanding any questions, please ask for clarification and, Avi, let's take it as it goes and maybe at the next break you can try to come back on the video.

MR. WEITZMAN: I am trying now. I am hoping that I will be able to connect. I apologize. My -- this is not working out as well as I had planned.
A L B E R T D I E D E R I C H M E T Z, called as a witness, having been duly sworn by a Notary Public, was examined and testified as follows:
EXAMINATION BY
MR. WEITZMAN:
Q. In any event, Dr. Metz, I appreciate your courtesy. Are you fine proceeding?
A. I am prepared to proceed, yes.
Q. Thank you, Dr. Metz.
My name is Avi Weitzman. I represent Rio Tinto. We can go through some preliminaries first. What's your full name?
A. Albert Diederich Metz.
Q. And are you represented here by counsel today?
A. Yes.
Q. Who is representing you?
A. Tom Bednar of the SEC.
Q. And have you previously been deposed

ever?
A. No, I have not.
Q. Have you ever testified --
MR. WEITZMAN: Yes, Kristin?
THE COURT REPORTER: I thought we lost Mr. Bednar. Okay. He's back.
MR. BEDNAR: We did. I am still on the audio. I'm coming back on the video.

Just carry on. Thank you.
Q. Dr. Metz, have you ever testified in court before?
A. No, I have not.
Q. Okay. So let's go through some ground rules. First thing is do you understand that you are testifying under oath?
A. I do.
Q. You understand that it's the same oath that you will take when you testify at a trial before a judge and a jury?
A. I do.
Q. You understand that the testimony you offer here today has the same effect as if testifying in a court of law before a judge and a jury?

A. I do understand.
Q. It's important that we speak one at a time. So if you would let me finish my question before you answer, I'd greatly appreciate it. Can you try to follow that instruction?
A. I will do my best.
Q. Thank you.
And if you don't understand any of my questions, please let me know before you answer. Otherwise I will assume that you understood the question.
A. I understand.
Q. Please do your best to answer audibly rather than with a nod or a gesture so that the stenographer can record your answer.
A. Is my audio -- audio coming through satisfactorily?
Q. It is for me.
THE VIDEOGRAPHER: Yes from the videographer.
Q. Is there any reason such as illness, physical condition or medication why you cannot give truthful and accurate testimony here

today?
A. No, there is no such reason.
Q. And if you need a break at any time, please let me know and we will try to accommodate you unless there is a question pending.

A. I understand.
Q. And if you hear an objection, unless you receive an instruction from counsel not to answer due to some issue relating to privilege, I'd request that you answer the question. Do you understand that?
A. I understand.
Q. You are here -- you are here today pursuant to a deposition notice; correct?
A. Correct.
Q. And you understand that you are testifying in the case of SEC versus Rio Tinto, Tom Albanese and Guy Elliott; correct?
A. Correct.
Q. When were you first contacted about being engaged in this case?
A. I don't recall the exact date. On the order of a year ago.

Q. Do you recall what year it was? I'm sorry. Would you repeat that?
A. I said I think it was on the order about a year ago, but I -- I can't be more precise.
Q. Would you expect it to have been about mid 2019?
A. Plus or minus a few months, but approximately.
Q. And do you recall who it was that first contacted you?
A. No, I don't remember his name.
Q. Was it any of the attorneys from the SEC on this -- at this deposition?
A. No. That attorney has since retired. Jack Worland --
Q. And was it --
THE COURT REPORTER: I'm sorry, sir, the witness?
A. I think it was Jack Worland. My apologies if I am misremembering his last name. I know his first name was Jack.
Q. Do you recall what was discussed at that initial contact?

MR. BEDNAR: Objection.
A. I'm sorry. Could you --
Q. Do you recall what was discussed at that initial contact?

MR. BEDNAR: Objection. I will instruct you not to answer. That calls for privileged communications.
Q. Were you provided any information about the case, just yes or no, were you provided any information about the case during that initial contact?
A. I was provided some information about the issues of this case, yes.
Q. Were you provided any information regarding assumptions you were asked to make in connection with your engagement?
A. No.
Q. Prior to your actual engagement in this case, had you been -- had you had any involvement at all in this litigation, reviewing documents or providing advice?
A. How would you define engagement in the case?
Q. Retention as an expert witness. So

let me rephrase it.
Before you were retained as an expert witness in this case, did you have any involvement in advising the SEC attorney about this case?
A. Prior to being engaged to write an expert report, I worked in the capacity of a consulting economist to the SEC on this case.
Q. When did you start working as a consulting economist to the SEC in this case?
A. Again, I don't recall the exact date, but that's the date that we have been discussing, so approximately mid 2019, but I can't be more precise than that.
Q. Okay. So -- so that I understand, there was some period of time when you were merely a consulting economist as an expert and at some point in time your consulting role was transitioned to a testifying expert; is that correct?
A. That's correct.
Q. Do you know approximately how long you were a consulting economist?
A. I -- I don't recall the timeline,

no.
Q. Was it weeks or months?

A. It was -- it was weeks, possibly months, but again, I just can't be precise. I don't recall.
Q. In your capacity as a consulting expert, did you provide -- I'm not asking what the advice was, but I am asking whether you provided comments on any draft filings by the SEC?
A. I do not recall commenting on any draft filing of the SEC.
Q. Do you recall whether you reviewed any draft filings from the SEC before they were actually filed, just yes or no?
A. I -- I don't believe so, no.
Q. Are you aware that there was an Amended Complaint filed in this case, a proposed Amended Complaint filed in this case?
A. I'm aware of a Complaint. I am not -- I haven't reviewed the entire history of the legal back-and-forth of this case.
Q. Do you recall whether you reviewed a proposed Amended Complaint in this case?

A. I -- I don't recall being presented with a document which was to be presented and asked to review it.
Q. Thank you.
Prior to your engagement in this action either as a consulting or testifying expert, did you have any views regarding Rio Tinto?
A. Any views regarding Rio Tinto? Can you be more -- what sort of views?
Q. Let me -- let me rephrase.
Prior to your involvement as a consulting or testifying expert in this case, had you followed or reviewed Rio Tinto's financial statements?
A. I don't recall that I ever reviewed financial statements from Rio Tinto. I should say that in my prior professional capacity I reviewed lots of financials from lots of companies. It's perfectly possible that Rio Tinto was among those companies, but I have no specific recollection of having reviewed financial statements from Rio Tinto.
Q. Prior to your engagement in this

action, had you had any dealings with executives at Rio Tinto in any capacity?

A. I have no recollection of dealing with any executives of Rio Tinto, no.

Q. Had you ever previously been retained to provide consulting or testifying expert services to the SEC?

A. No.

Q. Have you ever previously been retained to provide consulting or testifying expert services to anybody?

A. I have worked in support of other testifying experts, sometimes in the role, for instance, of case manager on behalf of cases for the Department of Justice, for example. You would say arguably that they did not retain me, per se, they retained somebody else.

Q. And how many times have you been retained by the Department of Justice as a case manager in support of testifying experts?

A. Well, again, I -- I want to be careful about whether -- saying whether they retained me or whether they retained somebody else and I supported somebody else. I have

worked on -- joining Global Economics in late 2018, I have worked on one case that I can recall specifically for the Department of Justice.

Q. What does a case manager do? Let me rephrase that.

In the one case you recall, what was your -- what were your duties and responsibilities as case manager?

A. In that case I conducted much of the empirical analysis and managed a team of supporting analysts and researchers to develop research in support of the testifying expert.

Q. And can you -- did the testifying expert testify in that case?

A. I believe, if I recall correctly, that the testifying expert filed an expert report, at which point -- subsequently the case settled. I don't believe -- my apologies if my memory is wrong, but I don't believe it got as far as deposition or testifying.

Q. Okay. And what case was that?

A. It was -- it was a Department of Justice case on behalf of Fannie Mae. The

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names of the parties I'd have to go back and look, but it related to fraud with respect to mortgage servicing practices.

Q. Did that case involve an event study to measure stock movements?

A. It did not involve the measurement of stock movements. It did involve a question of artificiality in prices comparing some service providers versus others.

Q. Other than that one case where you served as a case manager on behalf of another testifying expert, had you ever been retained by any client to serve yourself as a consulting or expert testifying witness other than this case?

A. This is the first case and currently only case in which I have personally been retained as the testifying expert.

MR. BEDNAR: Avi, I think we may have lost you from the video again, or at least from my screen.

MR. WEITZMAN: You did lose me. I apologize. I am trying to reconnect. I really don't know what's going on here.

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Can we go off the record for just a few minutes so I can try to reconnect.

THE VIDEOGRAPHER: The time is 9:54 a.m. and we are going off the record.

(Recess was taken from 9:54 to 9:56.)

THE VIDEOGRAPHER: The time is 9:56 a.m. and we are back on the record.

BY MR. WEITZMAN:

Q. Dr. Metz, we shipped to you several -- a couple of binders of documents. Do you have those in front of you?

A. I do.

Q. And did you have an opportunity to review those before the deposition today?

A. Depending on what you mean by "review." I looked at the binders and flipped through some of the comments or contents.

Q. Okay. Thank you.

Can you turn to the first binder, which contains Exhibit 212. If we can publish that.

(Defendant's Exhibit 212, Expert
Report of Albert Metz, Ph.D., December 20,

2019, marked for identification.)
A. Yes, I have Exhibit 212.
Q. And is that a copy of your opening expert report in this action?
A. It appears to be, yes.
Q. And if we can turn to page 51 of the expert report. Is that a copy of your signature?
A. Yes.
Q. It's also on the screen, if that simplifies things.
A. Yes, that is -- that is a copy of my signature.
Q. If you can turn to your CV, which is Appendix B attached to your opening report. It's on page 60 of the PDF.
A. I have it. I have it.
Q. Is this your current -- is this your current CV?
A. I believe so.
Q. Are there any changes or additions to your CV since you submitted your expert report in December 2019?
A. I'm not quite sure I understand the

question. Could I change my CV? There are perhaps other things I could add if I wanted to, but have I changed it?
Q. I am asking whether you --
A. I'm not quite sure I understand the question.
Q. The question is have you changed your CV since December 2019?
A. I don't think so.
Q. Okay. Your fee in this matter is $700 per hour; is that correct?
A. I believe that's reported in the report and that's the number I recall, yes.
Q. Is that your standard rate or is that a different rate for the SEC?
A. Well, as this is the first time I've worked as a testifying expert, I suppose by definition it's my standard rate.
Q. Is that the same rate you charged when you were a case manager?

A. No.
Q. In that DOJ matter.
A. No, it's --
THE COURT REPORTER: I'm sorry.

"In" --
Q. In that DOJ matter. What was the rate you charged as a case manager in that DOJ matter?
A. My typical rate when I am supporting other expert witnesses is $650 an hour. It is possible that in that particular DOJ case I may have worked at a different rate from that. I do not recall.
Q. Would it have been a higher or a lower rate than $650 an hour?
A. I don't recall.
Q. Did you have a team supporting you in the drafting of your expert reports in this case?
A. Yes.
Q. How many individuals supported you in your expert report drafting?
A. I had a team of -- I had a primary case manager and the more experienced researchers. I also had a number of research assistants. That number would vary over time. So at any moment in time I might have had more people working with me and at other moments in time I may have had fewer people working.

Q. Can you estimate for me at the high -- low and the high range of how many people you had working for you at any given time?
A. Not having checked this, my guess would be that it would have ranged between four and seven.
Q. And I think you had mentioned in your report that their rates, hourly rates, were between 150 and $400 an hour; is that correct?
A. I believe that's what's stated in the report. That's my recollection.
Q. What's your title at your current place of employment?
A. Managing director.
Q. As a managing director do you have

any equity in -- at Global Economics Group?
A. I do not.
Q. Are you purely a salaried employee of Global Economics Group?
A. I work under what they call the risk model where my compensation is a function of

revenue generation, so I am not strictly a salaried employee.
Q. How long have you been working at Global Economics Group?
A. I joined Global Economics Group in October of 2018.
Q. Since joining in October 2018, I think you told us that you worked on a DOJ matter and that was an SEC matter. Are there any other matters that you have been involved in?
A. There are several other cases that I've worked on in different capacities.
Q. Did any of those cases involve examining the materiality of stock price movement? Let me withdraw that question.
A. By material --
Q. Did any of those -- did any of those cases involve conducting an event study or regression analysis with respect to stock price movement to determine whether information or releases or news was material?
MR. BEDNAR: Objection. Compound.
MR. WEITZMAN: You may answer the

question.
A. Much of the work that I have been involved in since joining Global Economics group involves various aspects that you mentioned. Almost, I won't say all, but almost all cases that I've worked on have involved regression analysis, for example. Many of the cases that I've worked on have involved artificiality or potential artificiality in prices. Sometimes they are bond prices, sometimes they are commodity prices, sometimes they are spreads, and many of those cases involve interpreting the extent to which news was related to changes in those prices and may have impacted the artificiality of those prices.

Q. Thank you. Let me -- let me -- I want to go back in time a bit.
I think you had said that you worked at Moody's; correct?
A. That's correct.
Q. And Moody's is a credit rating agency; correct?
A. Correct. And they have other

services, but yes, they are known as a credit rating agent.
Q. You work there, according to your CV, approximately 15 years; is that right?
A. That's correct.
Q. And according to your CV, you were involved in the development of credit rating methodology at Moody's; is that right?
A. Not always, but yes, particularly towards the end of my tenure at Moody's I was the managing director of the global methodology development group. So I had responsibility for developing all the credit rating methodologies across Moody's suite of methodologies.
Q. And according to your CV, you were also responsible for default and ratings performance research for all product lines; is that correct?
A. Correct. Again, not initially upon joining Moody's, but shortly after joining Moody's, yes.
Q. Did those product lines that you were involved in, did any of them include mining companies?

A. Yes.
Q. Did they include particular mining companies or was it just generic category of mining companies?
A. I -- I'm sorry. I just -- I don't quite understand the question.
Q. Sorry. When you refer to a product line in your CV, what are you referring to?
A. Generally Moody's has organized itself in -- across broad sectors. So, for instance, we have the corporate financial group versus the financial institution group versus the structured finance group and so on and so forth. Within those there are various sectors,

so that those groups have organized themselves in different sectors, and within structured finance you might have the RMBS team versus the CLO team versus the -- and so on and so forth. Within the corporate financial group you might have the metals and mining versus pharmaceuticals and so on and so forth.
Q. Okay. Thank you so much.
Let me turn real quickly to your Ph.D. from the University of Chicago in 2002.

What was the topic of your dissertation?
A. Wow. You know, I don't remember the title. That's probably sad, but it's been twenty years. The -- the topic was the impact of the Tax Reform Act of 1986 on commercial real estate values and prices. Not a hot topic in 2002, but I would say somewhat prescient, if we think about what happened with real estate prices a few years later. What it was called -- it may have been called that, the effect of the Tax Reform Act of 1986 on commercial real estate prices. I don't remember exactly what the title was, but that was the substance of it.
Q. If you can turn to your expert report, Exhibit 212, and turn to page 64 through 66, which is your publications, page 5 and 6 of your CV.
A. Uh-huh.
Q. Are there any other publications that you are responsible for that are not listed here in the past ten years?
A. It depends on how technical we want to be. Literally, there are numerous

publications coming out of Moody's credit policy research group on quarterly ratings, performance updates, default study updates, I mean, the list is lengthy, and I am a co-author on many of those reports. I don't -- I don't tend to list them on my CV, since I don't think they are particularly germane to most things and people's interest in those reports is specialized, but if I wanted to bulk up my CV by listing all of those, I suppose I could, but I don't believe there are any publications of broader interest that are omitted from the CV.

Q. If I can ask you to limit your answer as best as possible to yes and no, if my question calls for a yes or no answer, I think this will be a much faster deposition.
Let me ask you this, Dr. Metz: Do any of the publications you have listed on page 5 through 7 of your CV concern event studies of stock price movements, yes or no?
A. I'm just reviewing. I don't believe that any of these that are listed are event studies on stock prices.
Q. Thank you.

A. I don't -- I don't think I see one.
Q. When you were -- apologies, Dr. Metz. I didn't mean to cut you off. May I proceed?
A. Please.
Q. Who drafted, literally put the words on the page of your expert report, opening or rebuttal?
A. Sorry. Who put the words on the page?
Q. Yes. Who drafted your expert report?
A. Well, there were sections of the report which I received as a draft from my team which I would then edit, but I reviewed certainly every word in the report and edited every section of the report.
Q. Can you estimate for us how much time you spent editing, drafting, reviewing materials in connection with your expert report?
A. I -- I don't know that I would want to try and estimate that. I'd have to go back and check the records, but many, many hours. I

wouldn't even want to ballpark it.
Q. Was -- you stated that your team drafted sections of your expert report and then you would edit it. Are there any sections that you were solely responsible for drafting?
A. Well, I consider myself solely responsible for the entire report. There were sections which did not begin with a first draft that had been prepared by my team. Which sections they were, I mean, we are going back

in time, but -- but I would consider myself solely responsible for the report.
Q. When you say that there were sections which did not begin with a first draft that had been prepared by your team, do you mean that there are some sections that you prepared the first draft of or that others outside your team prepared a first draft of?
A. I mean that there would be some sections which I prepared the first draft of.
Q. And do you recall what sections those were at this point in time?
A. I wouldn't want to -- I wouldn't want to hazard a guess.

Q. You have no recollection as you sit here as to what sections you drafted in the first instance?
MR. BEDNAR: Asked and answered.
A. Again, I could -- I could try and remember, but, you know, I might -- I might very well be wrong, if you want guesses as opposed to answers.
Q. No, I am looking for answers, not guesses, so I appreciate that.
There is an Appendix C attached to your expert report which involves an analysis of the efficient market hypothesis with respect to Rio Tinto; correct?
A. Appendix C of this -- of this first report, yes, that's correct.
Q. Correct.
THE COURT REPORTER: Counsel, counsel, hold on. Could we just take one second. I'm getting booted off.
MR. WEITZMAN: Okay. Let's go off the record.
THE VIDEOGRAPHER: Should we go off?
THE COURT REPORTER: Yes.

THE VIDEOGRAPHER: The time is 10:17 a.m. and we are going off the record.
(Recess was taken from 10:17 to 10:18.)
THE VIDEOGRAPHER: The time is 10:18 a.m. and we are back on the record.
THE COURT REPORTER: Phil, did we lose everybody from audio? Mr. Weitzman?

THE WITNESS: I hear you.
THE VIDEOGRAPHER: Yes. I think the witness is just waiting.
THE COURT REPORTER: Okay. We are back on.
THE WITNESS: Can you all hear me?
THE VIDEOGRAPHER: Yes.
THE COURT REPORTER: Okay. We are back on the record.
MS. VALLETTE: I don't think we can hear Avi.
THE COURT REPORTER: No. No.
THE VIDEOGRAPHER: Shall we go off again?
MR. WEITZMAN: I apologize. No, no, I'm fine. I apologize. I was on mute.

THE COURT REPORTER: Hold on. I'm getting -- hold on. I'm getting -- I'm getting booted off again. Yes, Phil, we have to go off. I'm sorry.
THE VIDEOGRAPHER: The time is 10:19 a.m. and we are going off the record.
(Recess was taken from 10:19 to 10:20.)
THE VIDEOGRAPHER: The time is 10:20 a.m. and we are back on the record.
A. Could I ask that you repeat the very last question that you asked?
Q. Yes. With respect to Appendix C attached to your opening expert report, do you recall how that was drafted?
A. How do you mean "drafted"?
Q. Did you write the first draft of Appendix C or did someone else on your team or elsewhere write the first draft of Appendix C?
A. My best recollection is that my team prepared the first draft of Appendix C.
Q. In addition to your editing the expert report draft, the sections of the -- let me rephrase.

In addition to edits that you made to the sections of the expert report that were drafted by your team, did anybody from the SEC provide you edits to your expert reports? Just yes or -- just yes or no. No -- no content.
A. Can you define "edits"?

Q. Yes. Did members of the SEC team provide suggested edits to your expert report, word changes, substance changes or anything of the sort?
A. I recall --
MR. BEDNAR: And I will instruct the witness -- Albert, sorry, Dr. Metz, I will instruct you to say yes or no and then wait for the follow-up. To the extent that he is calling for the substance of our communications with you, that's privileged and I will instruct you not to provide that.
THE WITNESS: I understand.
A. The answer to your question is yes.
Q. What do you understand your role as an expert witness in this case to be?
A. I'm sorry. The first part of your

question cut out.
Q. What do you understand your role as an expert witness in this case to be?
A. I understand my role is to review documents, conduct economic and statistical analysis, to formulate expert opinions on certain considerations in this case, to prepare a report summarizing those opinions, and to provide testimony as necessary.
Q. Do you consider yourself to be independent from the SEC?
A. How would you define "independent"?
Q. Do you consider yourself to have -- well, let me withdraw that.
If you would turn to page 3 of the PDF, Exhibit 212. That's the scope of your engagement paragraph, paragraph 4.
A. Uh-huh.
Q. You summarize in paragraph 4 your understanding of the scope of your engagement with respect to your opening report; correct?
A. Correct.
Q. At any point in time before you drafted your expert report, were there other

assignments or objectives that you were provided by the SEC that are not reflected within the scope of this engagement?
MR. BEDNAR: And, again, just a yes

or no.
A. Would you mind repeating it.
Q. Yes.
At any time -- at any point in time before you drafted your expert report, were there other assignments or objectives that you were provided by the SEC that are not reflected within the scope of this engagement?
A. Yes.
Q. Were the -- were there -- withdrawn.
What additional assignments were you asked to complete by the SEC that are not reflected in paragraph 4 of your expert report?
MR. BEDNAR: Objection. I will instruct you not to answer.
MR. WEITZMAN: What's your basis, Tom?
MR. BEDNAR: It's protected under Rule 26. It's our communications with him outside of those that are specifically

allowed to be the subject of discovery under the rules, therefore it's protected by privilege and work product.
Q. Sir, were there any event studies that you conducted that are not reflected in your opening report that were conducted prior to the -- your signing of the opening -- your opening report?
A. Were there any -- can you just ask it one more time.
Q. Yes.
Did you conduct any other event studies prior to December 2019 in connection with your retention by the SEC that are not summarized or reflected in your opening report?
A. Summarized or reflected in the opening report? I would say no.
Q. Prior to the issuance of the opening report, did you conduct any economic analysis that is not summarized or reflected in your opening report?
MR. BEDNAR: Avi, can you be a little less vague?
MR. WEITZMAN: Probably not, but I

will do my best.
Q. Prior to your signing of this

opening report, did you conduct any additional analyses regarding Rio Tinto, economic or econometric analyses regarding Rio Tinto that are not reflected in this opening report?
MR. BEDNAR: Objection. Vague.
A. Again, there was a period of time where I was working on a consulting capacity and during that period of time I conducted some analyses, which are not reflected in this report.
Q. Do you recall approximately when it was that you switched from a consulting to a testifying expert?
A. I believe we discussed that, and no, I don't recall exactly when that switch occurred.
Q. Okay. Did you sign separate engagement letters for your consulting and your testifying expert roles?
A. All these administrative questions. I'd have to go back and check what letters I signed at what date. I -- it's not something I

keep track of.
Q. Are there any documents that reflect, to your knowledge, when your role switched from a consulting to a testifying expert?
A. To the extent such documents are routine, I imagine they exist.
Q. Do you recall any such documents at this point in time?
A. I remember signing engagement letters with the SEC.
RQ MR. WEITZMAN: Tom, we would request a copy of those engagement letters. You can redact them to the extent they reveal any attorney/client privileged information, but the date by which he was a consulting expert versus a testifying expert is relevant and we would request that you produce them.
MR. BEDNAR: If you send us something memorializing specifically what you are requesting, we will respond.
Q. Sir, did any of the analyses that you conducted when you were a consulting expert that were not included in your opening report,

did any of them work their way into your rebuttal report?
A. Not that I recall, no.
Q. And so as you sit here today, do you have a recollection of -- let me -- let me rephrase.
Can you tell me the general subject matters of the analyses you conducted that have not worked their way into either the opening or the expert report?
MR. BEDNAR: Objection. Avi, the rules protect his communications with us. It also protects discovery into drafts of his reports in any form. If you have a specific question about a subject and did he do analysis on that subject different from the report, that may not be objectionable, but a general question 'tell me all the work you did that's not in your report' I think is clearly protected under the rules.
MR. WEITZMAN: Okay. Well, I, frankly, disagree. I don't think you can hide the analyses and work product he did

by merely not disclosing them in the report, but we can move on and reserve on that issue.
Q. Let me ask you this, Dr. Metz: Did you conduct any analyses, econometric or economic analysis regarding Rio Tinto's credit ratings or bond prices?
A. Economic or econometric analysis of credit ratings or bond prices for Rio Tinto?
Q. Correct.
A. Yes.
Q. And did those analyses get disclosed in your opening or your rebuttal report?
A. No.
Q. Whose decision was it not to disclose those analyses in your opening or rebuttal report?
MR. BEDNAR: Objection.
MR. WEITZMAN: You may answer, sir.
A. I don't know whose decision it was. I agreed that that analyses was not pertinent or relevant to the opinions in either of my reports and would have been extraneous to have included.

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A. Metz

Q. When you say that they were not pertinent or relevant to the analyses in your reports, is it fair to say that the analyses you conducted were not favorable to the SEC's case?

A. No, I'm not saying that in any way.

Q. Okay. Were the analyses that you conducted regarding credit ratings or bond prices for Rio Tinto relevant to the report that Dr. Hubbard provided?

A. I -- I don't even know what that question means. I'm sorry.

Q. Well, sir, you said that the analyses you conducted regarding credit ratings and bond prices were not relevant or pertinent to your expert reports. I am wondering whether they were relevant or pertinent, using your words, to Dr. Hubbard's expert opinions?

A. There -- Dr. Hubbard conducted a similar analysis and reached a similar conclusion which is, in my view, extraneous to the matter at hand.

Q. So just so I understand, your analyses -- let me withdraw that.

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A. Metz

Was your analysis that you are referring to here, did it concern Rio Tinto's credit ratings?

A. No.

Q. Was the analysis that you are referring to here, did it concern Rio Tinto's bond prices?

A. Yes.

Q. And the analysis you conducted was consistent in its conclusions with the conclusions that Dr. Hubbard reached in his opening report regarding Rio Tinto's bond prices; is that fair to say?

MR. BEDNAR: Objection. Avi, what exactly in Dr. Hubbard's conclusions are you referring to?

MR. WEITZMAN: Sir, you may answer if you understand the question.

A. No, I share the question. Can we point to something in Dr. Hubbard's report or -- there might be things in Dr. Hubbard's --

Q. We are going to get to that. We are

going to get to that, Dr. Metz, and maybe it will be simpler at that point in time.

A. Okay.
Q. Have you ever met Dr. Hubbard?
A. I -- I don't recall having met Dr. Hubbard. It's not impossible that our paths crossed, but I simply don't recall having met him.
Q. Had you ever heard of Dr. Hubbard before this case?
A. I've heard the name, yes.
Q. Were you familiar with his credentials prior to this case?
A. Familiar with his credentials? I certainly had never looked at his CV.
Q. Were you aware that he was the former dean of the School of Business at Columbia University?
A. I -- I don't think I was aware of that, no.
Q. Were you aware that he was the chairman of President George W. Bush's council of economic advisors?
A. My guess is that that is why his name is familiar to me.
Q. And what is the council of economic

advisors?
A. I've never looked at their mission precisely. I would expect it's economists who provide advice to the President.
Q. Is Professor Hubbard someone who you respect as an economist?
A. I've -- I've --
MR. BEDNAR: Objection. Foundation.
A. -- never considered that.
THE COURT REPORTER: I'm sorry. Can I get the answer again.
A. I've never formed that opinion.
Q. Is Professor Hubbard someone who you admire as an economist?
MR. BEDNAR: Objection. Foundation.
A. I would give the same answer. I haven't stopped to consider whether I admire or don't admire Dr. Hubbard. I wish him health and long life.
Q. You reviewed Dr. Hubbard's expert

report in this case; correct?
A. I have, yes.
(Defendant's Exhibit 224, Expert Report of Glenn Hubbard, February 21, 2020,

marked for identification.)
Q. Can you turn to Exhibit 224 in the binder.
A. Yes, I have Exhibit 224.
Q. And if you can turn to page 117, which is Appendix B.
A. Appendix B, Documents Considered?
Q. Correct. This is -- for the record, this is a 23-page appendix of the documents that Professor Hubbard considered in reaching his conclusions.
Sir, after receipt of Dr. Hubbard's report, did you review the documents identified in Appendix B?
A. What do you mean by "review"?
Q. Did you personally read each of the documents identified in Appendix B?
A. Did I read every word of every document in Appendix B, is that the question?
Q. That is the question.
A. I did not read every word of every document.
Q. Did you read some words of every document in Appendix B?

A. "Every" is a strong word. I'm not prepared to say that I reviewed some words of every document in Appendix B personally.
Q. How did you choose -- let me withdraw that.
How many documents in Appendix B did you review personally?
A. I have -- I have never tabulated or tried to keep track of that.
Q. How did you decide which documents in Appendix B to review?
A. Personally?
Q. Correct.
A. I mean, well, so my team and I have a process for handling documents. This case, of course, has a rather voluminous number of documents when you consider analyst reports and press releases. It is not standard practice

for me to read every word of every document or even necessarily some words of every document. I rely on my team following my instructions and guidance often to provide a first review of documents for relevance, which are then either in full or in summary fashion passed up to me,

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A. Metz

and in many cases I choose to go back to the source document and read further. In some cases, based on the summary, I may feel that it's not necessary.

Q. As to any documents that you go back and review further with respect to the source documents, do you read them online or printed up?

A. Typically or in this case?

Q. In this case.

A. In this case, certainly the overwhelming majority of documents I read in an electronic form.

Q. In your rebuttal report you stated that in formulating your opinions in the rebuttal report you have, quote unquote, relied upon the Hubbard report including all backup materials, end quote. Do you recall that?

A. Do I -- I mean, I'll take your word for it that that's what's written in my report, yes.

Q. Is it fair to say that you personally did not review all backup materials to the Hubbard report?

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A. Metz

A. Again, I don't know what you mean by "review," if you equate the word "review" with read, but my team reviewed all of those materials and I relied on their professionalism and experience to help sort through the subset of documents that might require me, my particular attention to read, so I would say that I relied on all of those materials, yes.

(Defendant's Exhibit 225, Expert Rebuttal Report of Albert Metz, Ph.D., April 10, 2020, marked for identification.)

Q. Can we turn to Exhibit 225. This is a copy of your rebuttal report; correct?

A. It appears to be, yes.

Q. And if you turn to the signature page, which is on page 81 of your rebuttal

report.
A. Uh-huh.
Q. Is that your signature?
A. Yes.
Q. And, again, did you go through -- did you draft this rebuttal report in the same way that you drafted your opening report where your team would provide drafts and you would

edit it?
A. Again, that --
MR. BEDNAR: Objection.
A. That's not how I would describe the opening report, nor how I would describe this report. I think I made clear some sections are prepared in a draft format by my team. Other sections are not. So it's a mischaracterization --
Q. Do you recall what --
THE COURT REPORTER: I'm sorry?
A. It's a -- it's a mischaracterization to suggest that my report is first drafted by someone else and then all I do is edit it. I think that's a mischaracterization.
Q. As you sit here today, do you recall any sections of your rebuttal report that you were the primary or preliminary drafter of?
A. I'd have to -- I'd have to flip through it if you want to take the time for me to do that.
Q. Why don't we do that during a break. I'd appreciate it very much. We will come back to it.

MR. BEDNAR: Avi, do you want to take a break now?
MR. WEITZMAN: Just a few more questions and then I will be prepared to take a break.
Q. Sir, you are aware that the SEC obtained an extension on its deadline to submit rebuttal reports for your rebuttal report in this case; correct?
A. Yes. I'm aware of that.
Q. And I understand that's because -- is that because you were traveling?
A. There may have been other reasons for the SEC's request, but yes, in fact, I was

traveling.
MR. WEITZMAN: Okay. Now would be a fine time for a break. Actually, one more question.
Q. You had testified earlier that you served as a case manager for a testifying expert in a case involving Fannie Mae. Do you recall that?
A. Yes.
Q. And do you recall the name of the

testifying expert in that case?
A. I should. It was my wife.
Q. What's her name?
A. Dr. Rosa Abrantes Metz.
Q. Thank you.
MR. BEDNAR: Do you want to spell that, Dr. Metz?
THE WITNESS: I better be able to spell it. And I better know her birthday too. Oh, I'm sorry. You actually want me to spell it.
MR. BEDNAR: Just for the reporter.
THE WITNESS: Understood. Understood. Rosa, R-O-S-A, Abrantes, A-B-R-A-N-T-E-S, Metz, M-E-T-Z.
MR. WEITZMAN: Thank you, Dr. Metz. If we can go off the record, this would be a fine time for a break.
THE VIDEOGRAPHER: The time is 10:47 a.m. and we are going off the record.
(Recess was taken from 10:47 to 11:04.)
THE VIDEOGRAPHER: The time is 11:04 a.m. and we are back on the record.

BY MR. WEITZMAN:
Q. Dr. Metz, you previously testified about an event study you conducted with respect to Rio Tinto's bond prices. Do you recall that?
A. I testified to doing some economic analysis around bond prices.
Q. Was that an event study or regression analysis of some sort?
A. I honestly don't recall if we did a regression. I don't think so. But, you know, we are going back in time.

Q. The analysis that you conducted, was that before your opening report or before your rebuttal report?
A. The analysis we are discussing was before I -- before the opening report.
Q. And I think you testified that it didn't make its way in your opening or rebuttal report because it was neither relevant, nor pertinent to the SEC's allegation; is that correct?
A. I don't think that's exactly what I said. It wasn't relevant or -- and didn't

contribute to the opinions of my opening report. I felt it was extraneous.
Q. Do you agree with me that it's relevant -- that your analysis regarding Rio Tinto's bond prices is relevant to the SEC's allegation that Rio Tinto profited from misinformation when it issued $5.5 billion in U.S. bonds and notes?
MR. BEDNAR: Objection.
THE COURT REPORTER: Counsel, did you say "this information" or "misinformation"?
MR. WEITZMAN: "Misinformation."
THE COURT REPORTER: Thank you.
A. I apologize. It was a long question. Could you repeat it, please.
Q. Yes. Why don't we turn to Exhibit 212, which is your opening report, and if you would turn to paragraph 26 on page 12 of that opening report, and if we can publish that.
Paragraph 26 of your opening report states that the SEC's Complaint, quote: "Further alleges that the Company profited from

this misinformation when it issued $5.5 billion in U.S. bonds and notes where the prospectuses for those bonds contained false information about the Riversdale mining assets, information that was known to be false by the Individual Defendants." Do you see that?
A. Yes, I see that.
Q. Would you agree with me that the analysis you conducted regarding Rio Tinto's bond prices is relevant and pertinent to that

allegation made by the SEC in its Complaint against Rio Tinto?
MR. BEDNAR: Objection.
A. No, I would not agree.
Q. Why would you disagree with that?
A. Because the analysis does not speak to this question.
Q. What did the analysis speak to?
A. The analysis spoke to how some bond prices moved in and around January 17th, 2013, but for the same reasons I explain in my report, an absence of movement on that date, in my opinion, is not drawing evidence of much of anything. So whether we found evidence of
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A. Metz
movement or not wouldn't, in my view, illuminate that element of the Complaint.
Q. Okay. After you received Dr. Hubbard's report and before you issued your rebuttal report, did you conduct any additional analyses or event studies that were not summarized in your rebuttal report?
A. After I received Dr. Hubbard's report and before I wrote my rebuttal report did I conduct --
Q. Before you signed your rebuttal report, yes.
A. Before I signed my rebuttal report did I conduct any event studies -- sorry, what was the rest of it?
Q. Following receipt of Dr. Hubbard's report, did you conduct any event studies or other analyses that were not summarized in your rebuttal report?
A. Yes.
Q. Can you describe what other event studies or analyses you conducted following receipt of Dr. Hubbard's report that were not summarized in your rebuttal report?
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A. Metz
A. Yes.
Q. Would you do so.
A. If I am allowed to. Well, as one example, Dr. Hubbard raised a concern that steel companies and mining companies should not be grouped together in an industry index such as the one I used, the S&P Metals and Mining Select Industry Index. I was, frankly,

surprised by that suggestion, but we conducted some analysis on how steel companies and Rio Tinto are correlated.
Q. Are there any other analyses that you recall conducting that were not summarized in your rebuttal report?
A. Yes.
Q. What others?
A. Well, I noticed in Dr. Hubbard's report that while he was careful to point out that an event study using the S&P index conducted on March 29th did not yield a statistically significant return, he was, I thought, somewhat conspicuously silent on whether an event study using either of his indices results in a statistically significant

return on March 29th. So I was curious to see if they would. And, indeed, the HSBC index does result in a statistically significant positive abnormal return on March 29th. Of course, I discount that result for all the reasons I explain in my report, but I was curious to see that.
Q. Any other analyses that you conducted that were not summarized in your rebuttal report?
A. Sitting here right now, those are what I recall. I -- perhaps with more time I'd recollect others, but that's what occurs to me now.
Q. If we can turn to the first of those analyses regarding steel companies and mining companies, what conclusions -- did you reach any conclusions regarding how steel companies and Rio Tinto were correlated following your -- the analysis you conducted?
A. I reached some observations. I suppose I reached some conclusions, yes.
Q. What conclusions did you reach?
A. Well, Dr. Hubbard had suggested that

the economics of an iron ore miner, such as Rio Tinto, granted it does other things, but accepting that it is largely an iron ore mining company, that their economics are at odds with the economics of steel manufacturers which, of course, consume iron ore as an input. He was

suggesting that there would be things that would be good for Rio Tinto that would be bad for steel companies and, therefore, it would be inappropriate to use steel companies in an industry control in the context of an event study for Rio Tinto. Of course, in my view the economics are not that clear at all. Obviously everything that increases the demand for steel is going to increase the demand for the things that go into steel like iron ore, and everything that decreases the demand for steel are going to decrease the demand for things that go into steel like iron ore. So there is quite a lot of reasons from just basic economic principles to think that steel companies and iron ore miners would have a strong positive correlation. So at best you might say that the theory is mixed. Again, I would tend to think

the theory suggests they should be positive, but granting everything, you might say that the theory is mixed about whether they are positively or negatively correlated. So I want -- it becomes an empirical question, so I wanted to conduct an empirical analysis, so I calculated the daily returns of all of those steel companies that Dr. Hubbard identified in his report, checked how correlated are they with each other, so that's eight steel companies and 28 pairwise correlations, and I checked how correlated are each of those with Rio Tinto, and I found, for instance, that on average those steel companies have a correlation of 73 percent with each other and on average they have a correlation of 73 percent with Rio Tinto, meaning they are just as related to Rio Tinto as they are with each other. Furthermore, the minimum correlation between any two steel companies was lower than the minimum correlation between any steel -- any of those eight steel companies and Rio Tinto. So this reinforced my prior belief that it's perfectly appropriate to combine

steel companies in an industry index to use as a control for Rio Tinto and that the empirics, in my opinion, supported what theory would tend to suggest, which is that they are

positively -- strongly positively related to each other.
Q. Did your analysis look at the correlation between the steel companies and Rio Tinto on April 8th, 2011?
A. My analysis included April 8th, 2011. One can't find correlation of a daily return on a single day.
Q. Is it correct to say that on April 8th, 2011, the steel companies and Rio Tinto did not move in the same direction?
A. It is correct that on April 8th, 2011, those steel companies had negative returns while Rio Tinto had a positive return, that's correct.
Q. Is that the reason why -- is that the reason why you did not include your correlation analysis in your rebuttal report?
A. No, not at all.
Q. If we can turn to Exhibit 212, which

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A. Metz

is your opening report, and if we can turn to Appendix A, which is the documents you reviewed.
Did you personally review all items -- and by "review" I mean read -- all items listed in Appendix A?
A. I am just flipping to Appendix A. Just bear with me, please. Your question is did I personally read every word of every document listed in Appendix A?
Q. First let me ask you did you personally read every document in Appendix A?
A. Every word of every document in Appendix A?
Q. I am not getting to every word first. Did you actually read, whether it's every word or in part, every document in Appendix A?
A. To the best of my recollection, I read some words from every document listed in Appendix A.
Q. How was it decided -- let me -- were there any documents you requested from counsel that were not provided to you?

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A. Metz

A. I can't recall an instance of requesting a document from counsel that was not

provided to me, but I haven't reviewed the whole history of back-and-forth.
Q. Okay. If you would turn to page 2 of Appendix A. There is a section titled Documents Submitted by Rio Tinto to SEC.
A. Uh-huh.
Q. Were these documents that you requested or that the SEC decided to provide you?
A. My recollection is that these were documents the SEC provided to me.
Q. In Appendix A of your opening report it lists one of the documents that you reviewed as the Complaint in this action; is that correct?
A. Yes.
Q. Did you request to review the Complaint? Yes or no.
A. Didn't need to -- no. The Complaint was sent to me.
Q. Did you find the review of the Complaint helpful to reaching any of your

opinions in this case?
A. No, I can't say that the Complaint helped me reach any of my opinions in the case. Some background information in the Complaint is interesting, but my conclusions were formed independently of the content of the Complaint.
Q. I'd like to turn to a discussion of Rio Tinto and its business.
Sir, you are aware that the production of iron ore generates most of Rio Tinto's revenues and profits; is that correct?
A. That's my understanding, particularly over this period of interest, yes.
Q. And during the period that Rio Tinto owned and controlled RTCM, Rio Tinto's underlying earnings were dominated by iron ore; correct?
MR. BEDNAR: Objection.
A. Define the word "dominated."
Q. Would you agree with me that Rio Tinto's underlying earnings during the period that it controlled RTCM were largely -- were largely defined by Rio Tinto's iron ore business?

MR. BEDNAR: Objection.
A. I mean, we could perhaps open up some of their financial statements and point to which earnings numbers you are -- you are concerned with. I --
Q. Let's turn to plaintiff's exhibit --
A. I would accept that iron ore was a large component and perhaps the single largest, depending on how one wants to define it, component of earnings.
Q. When you say perhaps the single largest component, it's a fact, sir, that iron ore was the single largest component of earnings for Rio Tinto during the period that it owned RTCM; correct?
MR. BEDNAR: Objection. Foundation.
A. I mean, again, I haven't memorized their financial numbers. I -- that sounds right to me.
Q. Are you aware, sir, that in 2011 Rio Tinto's entire coal business comprised only 10 percent of Rio Tinto's consolidated sales and revenues?
MR. BEDNAR: Objection. Foundation.

A. Again, I haven't committed these financial numbers to memory, so I -- I can't on my own memory say that you are right or wrong.
(SEC Exhibit 141, Rio Tinto 2012 Annual Report, marked for identification.)
Q. Well, let's turn to Plaintiff's Exhibit 141. I'm sorry. SEC Exhibit 141, which is in the first binder. And if we can put that on the screen and turn to page 221 of the PDF.
MR. BEDNAR: That's page 219 of the report, the page number that will be in the report?
A. The page that begins "Rio Tinto financial information by business unit"?
Q. Yes, but it's page 221 that I am turning you to.
MR. BEDNAR: Avi, are you on 221 of the PDF or the page that has 221? Because I don't think that what he has corresponds to the PDF's pagination.
MR. WEITZMAN: Fair enough. It's page 221 of the PDF. If we can put that on the screen, Joshua.

0070

A. Metz

MR. ROBBINS: Yes, it's loading.
I'm sorry for the delay.
MR. WEITZMAN: It's okay.
Q. On page 219 of the PDF, sir, this is a page titled Rio Tinto financial information by business unit. Do you see that?
A. Uh-huh. I do.
Q. And do you see that in the three-quarters of the way down there is a section titled Energy?
A. I see that.
Q. And do you see Rio Tinto Coal Australia for 2011 had gross revenues of 5,872 in millions?
A. Yes, I see that.
Q. And in -- and in 2011 there was no gross revenue for RTCM; correct?
A. That appears to be what's reported here, yes.
Q. And in 2012 the gross revenues for Rio Tinto Coal Australia is 4,998. Do you see that?
A. Yes, I see that.
Q. And is that $4 million? What number

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A. Metz

is that? I'm sorry.
A. Well, it appears that these numbers are reported in U.S. millions of dollars, so I would read that to be 4 billion 998 million.
Q. Okay. And Rio Tinto Coal Mozambique had gross sales in 2012 of $10 million; correct?
A. That appears to be what's reported here, yes.
Q. And in 2012 the revenue of $10 million was a negligible amount of revenue for Rio Tinto; correct?
A. Well, I'll take 10 million if you are offering it, but I would agree -- not to be difficult -- that in a company the size of Rio many people might use the word "negligible" to describe a revenue item of 10 million.
Q. In fact, that revenue item of $10 million in 2012 comprised only two-tenth of 1 percent of Rio Tinto's coal revenue; isn't that correct?
MR. BEDNAR: Objection. Foundation.

A. I haven't done that calculation. I'm not going to argue that your arithmetic is

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A. Metz

wrong.

Q. Are you aware, sir, that in 2011 iron ore comprised 85 percent of Rio Tinto's total underlying earnings?

A. Again, I haven't done that calculation, but I am willing to accept that your arithmetic is correct.

Q. Are you aware, sir, that in 2011 Rio Tinto Energy's product group comprised only 7 percent of Rio Tinto's total underlying earnings?

A. Again, I haven't conducted that calculation, but I am willing to accept that your arithmetic is correct.

Q. Are you aware that in 2011 iron ore comprised 99 percent of Rio Tinto's total underlying earnings?

A. This might get repetitive, but I haven't done that calculation, but I am prepared to accept your arithmetic is correct.

Q. And are you aware, sir, that in 2012 Rio Tinto's entire energy product group comprised less than half of 1 percent of Rio Tinto's total underlying earnings?

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A. Metz

MR. BEDNAR: Objection. Foundation.

A. I haven't conducted that calculation, but I am willing to believe your arithmetic is correct.

Q. Sir, in opining about the materiality of the RTCM impairment to investors, was it important for you to understand how RTCM's business and financial results fit within the broader picture for Rio Tinto?

MR. BEDNAR: Objection. You are mischaracterizing the opinions that he has provided. He hasn't opined on materiality to investors.

Q. Sir, let me rephrase.

In providing your opinions in this case, was it important for you to understand how the RTCM business fit within the broader picture of Rio Tinto's financial statements?

A. Not particularly. RTCM was a -- or

perceived to be at the time it was acquired a fairly-long-lived asset whose potential would be realized in the future, and so understanding its contribution to revenues in 2011 or 2012

doesn't necessarily or even particularly speak the value of the asset or the acquisition when one expects that it's going to ramp up production and produce revenues largely to be realized in the future. As an example, if a company says 'we have a vaccine for COVID,' I imagine that's worth quite a lot today now. Maybe it will take a year to ramp up production and start generating revenue from it. That doesn't strike me as particularly important to understanding that it's valuable today.

Q. Do you have -- did you do any analysis or have an understanding as to how RTCM's anticipated ramp-up was going to -- was going to influence or impact Rio Tinto's financial statements?

A. It wasn't necessary --

Q. Yes or no, sir.

A. -- for me --

Q. I am just asking whether you had an -- conducted that analysis.

A. So -- I'm sorry. So repeat your question.

MR. BEDNAR: Objection. Vague.

Q. Did you conduct any analysis to determine how RTCM's ramp-up in the future was anticipated to affect Rio Tinto's financial statements?

MR. BEDNAR: Objection. Vague.

A. It is vague. I am struggling to answer that question. The -- I conducted an event study to evaluate how the market reacted to the acquisition and concluded that the market considered the acquisition to be valuable and accretive.

Q. Sir, that wasn't my question. You had testified that the -- what was more relevant to you than looking at the financial statements currently was the value of the asset or the acquisition as you ramp up production and produce revenues. I was wondering if you conducted any analysis regarding RTCM's

anticipated revenues in the future and ramp-up.
A. Let me be clear. The question is not how I would value it. The question at hand was how the market perceived the acquisition. So whether Albert Metz thought this was a great acquisition is utterly beside the point. I did

not sit down and try and do my own projection of what I thought future revenues, earnings or profits from RTCM might be, because the outcome of such an analysis is utterly irrelevant.
Q. You listed the 2012 annual report as one of the documents you reviewed and considered in connection with your expert reports; correct?
A. I believe that's correct, yes.
Q. Did you analyze the annual report to determine how RTCM and its revenues and sales fit within the broader picture of Rio Tinto's business, yes or no?
MR. BEDNAR: Objection.
A. I did not conduct such an analysis as it was not relevant to form any opinions I have in my report.
Q. As part of your analysis in this case, did you consider what you believed analysts or reasonable investors -- withdrawn.
As part of your analysis in this case, did you analyze what analysts or investors would consider of greatest interest to them with respect to Rio Tinto's financial

results?
A. I am not --
MR. BEDNAR: I am going to object. Vague.
A. Yeah, I mean, different analysts and different investors at different moments in time might be more or less interested in different things. I don't think there is an answer to that question.
Q. So you are not purporting -- is it fair to say that your expert report does not purport to identify a consensus as to what analysts or investors viewed was important to them at different times?
MR. BEDNAR: Objection.
A. Around certain key dates of interest

in this case I did analyze and summarize analyst and in some cases media commentary related to the events of this case. I did not ask whether somebody else somewhere else was commenting on their diamond division that day. It doesn't strike me as relevant to the question of RTCM.
Q. Do you agree with the general

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A. Metz

statement that investors care more about those business lines at Rio Tinto that generate massive underlying earnings?
MR. BEDNAR: Objection. Foundation.
A. Would you mind repeating it.
Q. Do you agree with the general statement that investors care more about those business lines at Rio Tinto that generate the bulk of the underlying earnings?
A. I -- I wouldn't want to speak to what an investor might care about at a particular moment. They might be more concerned with litigation or a pending regulatory change. I -- certainly businesses want to earn revenue. I'll grant you that.
Q. And is it fair to say that investors care more about those business lines that earn more revenue as compared to negligible amounts of revenue, would you -- would you agree with that statement, sir?
MR. BEDNAR: Objection.
A. I can't -- I can't necessarily agree with that statement. An investor might be very concerned with potential future revenue more

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A. Metz

than current realized revenue.
Q. And when you say that an investor may be more concerned about potential revenue, future revenue, have you conducted any analysis with respect to Rio Tinto to determine that investors were concerned with potential -- let me withdraw the question.
Are you familiar with SEC Staff Accounting Bulletin number 99 on materiality?
A. I don't know what you mean by "familiar."
Q. Have you read it, sir?
A. No.
Q. You have never read SAB 99?

A. Can I see it?
(Defendant's Exhibit 232, SEC Staff Accounting Bulletin: No. 99 - Materiality, marked for identification.)
Q. If we can turn to Exhibit 232.
A. Sorry. My binder is a little uncooperative. 232.
Q. Have you ever read this document before?
THE WITNESS: May I -- may I -- can

0080

A. Metz

we take a minute break. I just spilled a cup of water. May I just clean it up, please.
MR. WEITZMAN: Of course. Let's go off the record.
THE WITNESS: Thank you very much.
THE VIDEOGRAPHER: The time is 11:43 a.m. and we are going off the record.
(Recess was taken from 11:43 to 11:45.)
THE VIDEOGRAPHER: The time is 11:45 a.m. and we are back on the record.
BY MR. WEITZMAN:
Q. Sir, do you recognize Defendant's Exhibit 232 as the SEC Staff Accounting Bulletin No. 99 on materiality?
A. I see that that's the title, yes.
Q. Have you ever read this document prior to today?
A. I -- I don't recall ever having read this document.
Q. You are not offering an opinion, sir, about the materiality of a -- of Rio Tinto's January 17, 2013, disclosure; correct?

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A. Metz

A. Correct.
Q. You don't believe -- you agree with me you are not qualified to offer an opinion about materiality as defined in SAB 99?
MR. BEDNAR: Objection. Calls for a legal conclusion.
Q. Do you hold yourself out -- let me withdraw.
Sir, do you hold yourself out as an expert on issues of materiality?
MR. BEDNAR: Objection. Avi, are you talking about materiality in an

economic sense, or materiality in the audit and accounting context of the document that you have on the screen?
MR. WEITZMAN: Okay. Let me rephrase.
Q. Sir, do you hold yourself out as an expert on materiality in the context of whether an announcement is material under law?
A. I am not a lawyer and I do not offer a legal opinion.
Q. Do you know the definition of materiality under the law?

A. Not precisely, no.
Q. Are you aware that the SEC considers there to be an assumption of immateriality if a misstatement relates to less than 5 percent of a financial statement?
MR. BEDNAR: Objection.
A. I am not familiar with the legal intricacies of how the SEC or anyone else may define materiality.
Q. Have you ever heard of a 5 percent threshold with respect to materiality?
A. It doesn't ring a bell.
Q. We talked earlier about iron ore, sir, Dr. Metz. Are you aware that equity analysts during the period that we are talking about here, 2011 through 2012, described iron ore prices as the key driver of Rio Tinto's stock price?
A. I recall reading --
MR. BEDNAR: Objection.
THE COURT REPORTER: I'm sorry, sir?
MR. WEITZMAN: You may answer, sir.
MR. BEDNAR: Objection. Form.
A. I recall reading analyst reports

that identify iron ore as a key driver of valuation, yes.
Q. And would you agree with me that that was a consensus view among equity analysts in 2011 and 2012?
A. That what was a consensus view?
Q. That iron ore was a key driver of valuation.
A. Well, people might argue about the word "key." Since Rio Tinto is predominantly

an iron ore miner, I would agree that a typical analyst would think that iron ore prices would be very important to the valuation of Rio Tinto.
Q. Let's move on to the event study that you conducted, Dr. Metz.
Rio Tinto is a dual-listed company; correct?
A. That's my understanding. Again, not as a lawyer, but that's my understanding.
Q. And Rio Tinto's stock is traded in the United States as an ADR, an American Depositary Receipt; correct?
A. Correct.

Q. And is it okay if I refer to Rio Tinto stock as an ADR for purposes of this deposition?
A. I wish you would, because I probably will.
Q. Okay. Thank you.
You conducted an event study to evaluate the movement of Rio Tinto's ADR price during the relevant time period; correct?
A. Correct.
Q. And as part of your event study, your model examined how Rio Tinto's ADR price moved on particular days as compared to the market as a whole and the relevant industry; correct?
A. Correct.
Q. And part of the reason why you did that is from an econometric point of view Rio Tinto's ADR price might move as a result of movements in the entire stock market; correct?
A. I probably wouldn't word it exactly that way. I would say that -- I would prefer to say that there are factors which would tend to drive all stocks and, hence, would drive Rio

Tinto. It's a -- I may sound like I am splitting hairs.
Q. Not at all.
And there are factors that also move stocks in the mining industry that may also move Rio Tinto; correct?
MR. BEDNAR: Objection.
A. Yes.

Q. And for that reason you attempt to control for the overall movement in the mining industry by using an industry index; correct?
A. Well, you are inserting the word "mining." There are what I would call factors that could impact the sector to which Rio Tinto would be benchmarked and I control for those with an appropriate sector control, the S&P Metals and Mining Select Industry Index.
Q. How do you define Rio Tinto's sector?
A. Well, I haven't formally defined Rio Tinto's sector. Rio Tinto is a metal and mining company. It has some other interests, such as coal mining, diamonds, trace amounts of gold, some gold, other things, uranium, I

believe. As a metal and mining company I followed standard practice and benchmark it to a highly-reputable third-party metal and mining equity index.
Q. Choosing the appropriate industry sector index is central to the design of a valid event study; correct?
A. It's -- it's certainly an important part of designing a valid event study, yes.
Q. Is there -- are you taking issue with my use of the word "central" to the design of a valid event study? You agree with me that it's central; correct?
A. Yes. Other things could be described as central as well. It's not unique. But yes, it's -- it's very important to designing a valid event study, I would agree.
Q. It's important in choosing the --
MR. WEITZMAN: Is everything okay? Can I continue?
THE WITNESS: I was hearing some noise on the line. I don't know if others were.
MR. WEITZMAN: Kristin?

THE COURT REPORTER: It wasn't me. It wasn't the court reporter.
MR. WEITZMAN: Yeah, I'm hearing someone else's phone, which appears to not be on mute. If everybody can mute, it would be helpful. Thank you.

Q. Would you agree with me that in choosing the appropriate industry sector index, it's important to include firms in that index that share similar economic characteristics with the subject firm?
MR. BEDNAR: Objection.
A. Similar economic characteristics is extremely broad. That could mean lots of things. You might mean a similar size, and in this case no, I don't think it's particularly important to group them with companies of a similar size, but I can't respond to that question.
Q. Okay. Do you think it's important to group in the industry index the subject company here, Rio Tinto, with companies in the same industry?
A. As a general proposition, I would

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A. Metz

agree.
Q. Dr. Metz, which company do you consider to be Rio Tinto's principal competitors in the mining industry?
A. I haven't conducted an analysis to identify its principal competitors.
Q. Can you identify any companies that are in the same industry and sector as Rio Tinto? Yes or no.
A. I mean, I'm not gonna just say yes or no. There are many ways to group companies by industry and sector. Depending on how we want to group them we will find some companies, and in other ways we will find other companies.
Q. Let me ask you if you are familiar with some companies. Have you ever heard of Vale?
A. Yes.
THE COURT REPORTER: Sir, could you spell that?
MR. WEITZMAN: V-A-L-E.
THE COURT REPORTER: Thank you.
Q. Do you recognize Vale to be a large miner that is a competitor of Rio Tinto's?

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A. Metz

MR. BEDNAR: Objection.
A. We would have to define "large." Competitor -- Vale is often mentioned in analyst reports in the context of discussing

Rio Tinto.
Q. You agree with me that Rio Tinto is a mining company in the same industry -- I'm sorry. Let me withdraw that.
You would agree with me that Vale is a large mining company in the same industry and sector as Rio Tinto; correct?
MR. BEDNAR: Objection. Asked and answered.
A. We would need to define our terms more carefully. Did they have the same SIC code, I don't remember. Do they have the same GICS code, I don't know. Do they have the same NAICS code, I don't know. Are they grouped together for purposes of determining industry aggregations in a CLO analysis by a rating agency, I'd have to go check. I mean, there is not one -- necessarily one answer to that question.
Q. Do you have an opinion, sir, or have

any knowledge as to what the five largest mining companies in the world are in addition to Rio Tinto?
A. No, I haven't conducted an analysis to try and identify the five largest mining companies in the world.
Q. Okay. Do you have -- have you ever heard of Anglo American?
A. Yes.
Q. Do you recognize Anglo American as one of the largest mining companies in the world?
A. I would not dispute that many people would characterize it that way.
Q. Do you recognize Vale as one of the largest mining companies in the world?
A. Again, I would not dispute that many people might characterize it that way.
Q. Do you recognize BHP Billiton as one of the largest mining companies in the world?
MR. BEDNAR: Objection to the characterization.
A. Many people might characterize it that way. Of course, to take that particular

example, they have, as I recall, an exposure to petroleum and oil, if I remember correctly,

which, for example, Rio Tinto does not.
Q. Okay. Fair enough. But let me ask it again, because I think my question is very different.
Is BHP Billiton considered by analysts as one of the largest mining companies in the world?
MR. BEDNAR: Objection to the characterization.
A. All I can say is that in many analyst reports which discuss Rio Tinto, one will often find a discussion of BHP Billiton in the same report.
Q. So just so I understand what you are saying, when you -- when you have reviewed equity analyst reports, you are aware that equity analysts look at Rio Tinto, and at the same time when they are evaluating how Rio Tinto is doing compared to competitors, they are looking at companies like Vale, Anglo American and BHP Billiton; is that fair to say?
A. Some analysts do that, yes.

Q. Okay. Now, as part of your event study, you selected the S&P metals and mining index as the industry sector index; correct?
A. I think, strictly speaking, it's the S&P Metals and Mining Select Industry Index, which is distinct from another metals and mining index, but without quibbling about it, yes.
Q. Okay. Can we just call it the S&P Metals and Mining Index?
A. That's perfectly fine with me.
Q. Thank you very much.
In your opening report you didn't discuss the constituent companies in the S&P Metals and Mining Index; correct?
A. I didn't list them, that's correct.
Q. At the time of your opening report, had you done any research to review the constituent companies in the S&P Metals and Mining Index?
A. Yes.
Q. And where did you learn what the constituent companies list -- in the S&P Metals and Mining Index were, how did you obtain that

information?
A. I instructed my team to pull the constituent list from databases.
Q. What database would that be?
A. I think it's Bloomberg.
Q. Is there a reason why your Appendix A to your opening report does not list that information as one of the documents you considered as part of your opening report?
A. Let me review Appendix A.
Q. If you would like to, you could go to Exhibit 212 and Appendix A is after page 51, 52 of the report.
A. Well, "Security Data, Historical data for Rio Tinto ADR, S&P Metals and Mining Index." That would include, I think, the constituents of the S&P Metals and Mining Index, and it's -- and my memory may be wrong about exactly which database was the source of those constituents, in which case I'm sorry if I am misremembering.
Q. Okay. So were you aware at the time that you selected the S&P Metals and Mining Index as your industry comparator index that it

did not include Vale as one of its constituents?
A. No. I selected the index --
Q. Sir, I am not trying to cut you off, but I just want to know whether you were aware. We will get to the reasons you selected the index in a moment. I think you are --
MR. BEDNAR: Avi, I am going to ask you to let him finish. No, you were vague as to the time, when he selected it or when he completed his report, and he is trying to specify when he considered whether Vale was there.
MR. WEITZMAN: That's fine, but --
MR. BEDNAR: I am objecting to your question if you are going to cut him off.
MR. WEITZMAN: My question was specific.
Q. Were you aware at the time that you selected the S&P Metals and Mining Index? So if the answer is no, at that time you were not aware, then I think that's the answer and I think we have got a -- we have got a --
MR. BEDNAR: Then I object --

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A. Metz

Q. -- yes or no answer to what they call a yes or no question.

MR. BEDNAR: Avi, I think the time that he selected, what do you mean by the time he selected? The time he first considered it or the time that he finalized the report that had it in there? You need to be precise in your words if you are going to insist on a yes or no answer.

Q. Sir, when you chose the S&P Select Mining Index, Metals and Mining Index as the industry comparator index for your opening report, were you aware that it did not include Vale within the index?

MR. BEDNAR: Objection. Vague.

A. This really is vague. My very first thought was to use the S&P Metals and Mining Select Industry Index, my very first thought. Before finalizing my report we did some more research and due diligence to confirm that that was reasonable, but it was literally the first index I thought of using, and before finalizing the opinions in my report I wanted to establish that it was appropriate for the case at hand.

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A. Metz

Q. Sir, my question is a specific question about your knowledge of the constituents of the S&P Metals and Mining Index. You will have all the time in the world when Mr. Bednar, if he wants to examine you, to explain why you selected it. My question is a specific one.

At the time that you selected it, before signing your report, were you aware that it did not contain Vale as one of its constituents?

A. Yes.

Q. Okay. At the time that you selected the S&P Metals and Mining Report, before signing your opening report, were you aware that it did not contain Anglo American as a constituent of the index?

A. Yes.

Q. At the time that you selected the S&P Metals and Mining Index before signing your opening report, were you aware that it did not contain BHP Billiton as a constituent of the

index?
A. Yes.

Q. Before signing your opening report, sir, were you aware that the S&P Metals and Mining Index did not contain Xstrata, another mining company, as one of its constituents?
A. Yes, before signing my report I was aware of the constituents of the S&P Metals and Mining Index.
Q. Before signing your report, were you aware that the S&P Metals and Mining Index did not contain Barrick Gold as one of its constituents?
A. Yes.
Q. You earlier referenced a term called S-I-C codes, SIC codes; correct?
A. Uh-huh, yes.
Q. What are SIC codes?
A. If I remember correctly, Standard Industrial Classification. It's one of many taxonomies for grouping companies into defined industry categories.
Q. Before signing your opening report, did you review the SIC codes of the constituents of the S&P Metals and Mining Index?

A. No.
Q. Are you aware how many of the S&P Metals and Mining Index constituents have the same SIC code as Rio Tinto?
A. As I recall, if we are referring to SIC code 10, I think it's eight.
Q. And how many constituents -- how many constituent companies were in the S&P Metals and Mining Index as of April 8, 2011, or any other time relevant to your analysis?
A. On the order of forty, plus or minus.
Q. So fair to say that a -- less than 20 percent of the companies included within the S&P Metals and Mining Index have the same SIC code group 10 as Rio Tinto?
A. That's correct. Of course, we don't know how many had the same GICS code or NAICS code, but yes, that's correct.
Q. I just want to understand. That's

testimony you know about today, but you were unaware of that fact, the SIC code classification, when you chose the S&P Metals and Mining Index and signed your opening

report; correct?

A. Correct. The S&P Metals and Mining Index is a standard industry benchmark for metals and mining companies like Rio Tinto. It's a highly-regarded, third-party provider. They publish 160 industry index or some such. This particular index has been published for fifteen years. Prior to Dr. Hubbard's objections I have never heard anybody suggest that it is a poorly-constructed index grouping companies which should not be grouped together. It is not always the case that people will find the SIC code of every member of every index. Dr. Hubbard is comfortable with the HSBC index even though he has no idea the names, let alone SIC codes of 180 members of his index, so --

MR. WEITZMAN: Okay. Sir, I am going to move to strike everything after the --

A. You know, it is somewhat misleading.

MR. WEITZMAN: I am going to move to strike everything after the word "correct." I have to caution you, sir, and instruct you that your answers are supposed to

respond to my question and if you could answer with a yes or no or correct or incorrect, you should stick to your answer if that answers the question. If your counsel would like to ask you questions after I'm done, he is more than permitted to. I'll move to strike everything after the word "correct."

Q. Are you familiar, sir, with SIC code major group 33, primary metal industries?

A. I believe there is an exhibit with some of this information. I don't know if it would be helpful to put that up in front rather than trying to do all this by memory. I do -- my recollection is 33 is primary metals, but I don't know if we have to rely on my memory.

Q. So I'll represent to you that SIC code 33 is primary metals and you can see it in

Exhibit 243 in volume 2 of your binder.
A. Yes. I am getting there. Thank you.
MR. BEDNAR: If you are going to ask questions on the exhibit could you just -- thanks.

(Defendant's Exhibit 243, Occupational Safety and Health Administration, Major Group 33: Primary Metal Industries, marked for identification.)
Q. At the top of the page, Defendant's Exhibit 243, there is a description of what the Major Group 33, primary metals industries, comprises; correct?
A. There appears to be, yes.
Q. Okay. And it states, and I quote: "This major group includes establishments engaged in smelting and refining ferrous and nonferrous metals from ore, pig, or scrap, in rolling, drawing, and alloying metals; in manufacturing castings and other basic metal products; and in manufacturing nails, spikes, and insulated wire and cable." Did I read that correctly?
A. I believe you read it correctly, yes.
Q. So if I understand it correctly, and just if you don't understand just let me know, but is it correct to say that the companies in

the primary metal industries group are typically processing the raw ore and materials and metals that mining companies sell?
A. I would accept that as a general characterization allowing for possible exceptions here and there.
Q. Okay. And so companies in Major Group 33, the primary metal industries, are acquiring -- they are buying raw materials from miners, is that -- is that generally correct in your understanding?
MR. BEDNAR: Objection.
A. I mean, again, as a general proposition, that seems reasonable. It's possible some of these companies have integrated vertically and maybe mine their own

ore, for example, but I'll accept that many of them probably don't and purchase ore from miners.

Q. So just using iron ore as an example, would you agree with me that an increase in iron ore prices redounds to the -- has a positive effect on the underlying revenues and profits of mining companies like

Rio Tinto?

A. We have to be very careful. Why did the price increase. So, for instance, if -- if we find out tomorrow that all of Rio Tinto's iron ore beds are, in fact, empty of iron ore and there is now a scarcity, the price of iron ore might go up. Rio Tinto is not better off. So we have -- we have to be a little bit careful about why the price goes up.

Q. So barring that example, a general increase in the commodity price, that doesn't -- that's not based on some sort of disaster or event that you are describing, that should generally redound to the financial benefit of the mining company, correct, assuming demand is the same?

MR. BEDNAR: Objection.

A. Well, again, if demand is the same, why did the price go up? I don't want to belabor the point. These things are more complicated than we sometimes think. Everything else being equal, which is a particular hypothetical intellectual state of the world, if the price were just suddenly

higher, people who sell iron ore would welcome that fact. But that's a hypothetical construct that economists use. It doesn't necessarily correspond to a real world event.

Q. Okay. When you say everything else being equal people who sell iron ore would welcome that fact, do you mean to say that it's financially beneficial for miners to have commodity prices typically increase, everything else being equal?

A. In this hypothetical of everything else being equal, people who sell something like to see the price of the thing they sell higher, yes. That's true for everything.

Q. And is the converse true, that people who buy something typically like to see the price of what they buy lower?
MR. BEDNAR: Objection.
A. Typically true.
Q. Okay. Do you know how many of the constituent companies in the S&P Metals and Mining Index were steel manufacturers?
A. I believe it's about eight.
Q. That's the same number of companies

in the S&P Metals and Mining Index who were actually miners; correct?
MR. BEDNAR: Objection.
A. No. No. The same number of people who had SIC code 10.
Q. Correct. Thank you, sir.
And SIC code 10 is what?
A. I don't have it in front of me. I think it's diversified companies, but I don't have it in front of me.
Q. SIC code 10 refers to metal mining; correct?
A. I don't have it --
MR. BEDNAR: What exhibit are you referring to?
Q. Sir, do you have a recollection that SIC code 10 refers to metal mining?
A. Whether it's metal mining or diversified mining, there are a lot of codes. If for some reason --
(Defendant's Exhibit 241, Occupational Safety and Health Administration, Major Group 10: Metal Mining, marked for identification.)

Q. Why don't we turn to Exhibit 241.
Does that refresh your recollection that SIC code 10 refers to metal mining, sir?
A. Yes. Thank you. But I point out that's metal mining. I mean, do we see coal mining? I'm not sure that I see coal mining. There may be other miners that are not necessarily categorized as SIC 10.
Q. But iron ore miners would all be characterized in SIC code 10, correct, that's your understanding?
A. I don't think you can --

MR. BEDNAR: Objection.
A. -- say that, all iron ore miners. Many company can have many interests and --
Q. Let's look at --
THE COURT REPORTER: I'm sorry? I'm sorry. The answer again, please.
A. I'm sorry. I was not agreeing with the question. Many companies can have many interests, one SIC code. So there could be a company which does some iron ore mining, but does not have SIC code 10. It's perfectly possible.

Q. Now, I think you testified earlier that when you first thought about an industry index, the one that immediately jumped to your mind was the S&P Metals and Mining Index; correct?
A. That was the first one that occurred to me, yes.
Q. Okay. And that's the one you chose?
A. Ultimately that I was satisfied that it was appropriate for this case.
Q. There are other mining indexes that can be chosen for industry comparative purposes; correct?
A. There are other mining indices, yes.
Q. And one of them is the HSBC Global Mining Index; correct?
A. Correct.
Q. Before you signed your opening report, did you do an analysis to determine whether the HSBC Global Mining Index would be a valid index for purposes of an event study?
A. I did not.
Q. Had you ever worked with the HSBC Global Mining Index before?

A. I don't recall having worked with that index before.
Q. That's the index that Professor Hubbard chooses in his expert report; correct?
A. One of the two that he puts forth, yes.
Q. And you are aware, sir, that Rio Tinto identified in its annual reports the HSBC Global Mining Index as a benchmark for evaluating stock performance; correct?

A. My understanding is it's one of other benchmarks that HSBC suggests for comparing purposes in part for determining some executive compensation, yes.
Q. Okay. And you a moment ago just said that HSBC suggests. Did you mean Rio Tinto suggests for comparison purposes?
A. If I said that -- yeah, if I misspoke, I'm sorry. Rio Tinto.
Q. Okay. And Rio Tinto had never suggested the S&P Metals and Mining Index for comparison purposes, correct, in any of its annual reports?
A. I never saw it suggest it, no.
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A. Metz
Obviously I can't testify that it never did, but I never saw that.
Q. The other index that Rio Tinto identified in its annual report as a comparator for benchmark purposes is a set of other comparator firms; correct?
MR. BEDNAR: Objection.
A. Well, that's not an index. That's a set of firms. Another index to suggest is what the FTS 30, which, of course, I don't think anybody would think is appropriate to use as a control in an event study, but they list some firms, yes.
Q. And in 2012, for example, they list eight comparator companies; correct?
A. I -- I don't recall.
Q. I'm sorry. 2011.
A. I think --
Q. In 2011 --
A. If I may, I think I have an exhibit in my rebuttal report which goes through this. It might be helpful to put that up.
Q. I -- I will do so. I don't have it
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A. Metz
handy right now, but I will -- I will find it and we will put it up in a moment.
A. Okay.
Q. Have you studied the HSBC Global Mining Index since Dr. Hubbard produced his opening report?
A. Yes, I have looked at it since reading Dr. Hubbard's report.

Q. Are you aware that the ten largest companies in the HSBC Global Mining Index were all metal mining companies during this relevant time period?
A. No, I don't think I have that awareness. I think a couple of them aren't identified, so I don't think you can say all ten. And of course, you are counting Rio Tinto twice and I believe you are counting BHP twice. So I would not agree that we know that the top ten unique corporate entities in that index have SIC code 10. I don't think that's a fair statement.
Q. Had you conducted an analysis to determine what percentage of the HSBC Global Mining Index is comprised of metal mining

companies?
A. On my end your audio is breaking up just a little bit. I have to ask you to repeat the question.
Q. Have you conducted an analysis to determine what percentage of the HSBC Global Mining Index was comprised of metal mining companies?
A. No. I don't know that such an analysis is possible with the information available.
MR. BEDNAR: Avi, I think that you are no longer on the video. As long as we can understand you, I am okay to proceed if you want to.
MR. WEITZMAN: Yes, if we can proceed, that would be great.
Q. Sir, you were aware before signing your opening report that Rio Tinto compares itself to the HSBC Global Mining Index; correct?
A. Among other things, yes.
Q. And despite that, you did no analysis to determine whether the HSBC Global

Mining Index would be appropriate for these purposes, correct, before signing your report?
THE COURT REPORTER: I'm sorry?
A. No.
THE COURT REPORTER: I'm sorry, Mr. Bednar, did you say something?

MR. BEDNAR: No, I didn't.
THE COURT REPORTER: Okay. Thank you.
A. I did not conduct an analysis on the HSBC index before signing my opening report.
Q. One of your criticisms of Professor Hubbard's reliance on the HSBC Global Mining Index is that Rio Tinto was a constituent of that index; correct?
A. Correct.
Q. And between 2010 and 2011, Rio Tinto made up between approximately 8.2 percent and 9.5 percent of the HSBC Global Mining Index, is that -- is that your conclusion?
A. I --
MR. BEDNAR: Objection. Are you referring to something specific?
Q. Sir, if you recall, are you able to

answer that question?
A. I am only aware of two fact sheets on HSBC which capture the weights on two days. They report some numbers. I don't remember off the top of my head what those numbers are. But in any event, I would have no knowledge of the weight of Rio Tinto on any other day.
THE COURT REPORTER: I'm sorry, sir?
Q. Are you aware --
THE COURT REPORTER: I'm sorry. The last part of the answer?
A. I said I'm not aware of Rio Tinto's weight on any other day besides the days identified in two fact sheets from the HSBC index.
Q. Let's turn to --
MR. BEDNAR: Mr. Weitzman, if there is a convenient -- Avi, if there is a convenient time for a break, we would appreciate it. We have been going for almost an hour and --
MR. WEITZMAN: Absolutely. If I can just get through the two exhibits that he is referencing and just identify them, that

would be great.
MR. BEDNAR: Okay.
Q. If you can turn to Exhibit 246.
A. I'm sorry. The number --

Q. And 247. 246 and 247.
A. Yes, I have them.
(Defendant's Exhibit 246, HSBC Global Mining Index, Factsheet date 30 April 2010, marked for identification.)
(Defendant's Exhibit 247, HSBC Global Mining Index, Factsheet dated 31 July 2013, marked for identification.)
Q. Are those the two fact sheets you are referring to?
A. Yes.
Q. Okay. And is it fair to say that Exhibit 246 reflects that as of April 30, 2010, Rio Tinto made up approximately 8.2 percent of the weight of the HSBC Global Mining Index?
A. That looks to be correct, yes.
Q. And turning to Exhibit 247, as of July 31, 2013, Rio Tinto made up about 9.5 percent of the weight of the HSBC Global Mining Index; is that correct?

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A. I think I need to get reading glasses. That looks to be correct, yes.
MR. WEITZMAN: Now is a fine time for a break, Tom. We can go off the record.
MR. BEDNAR: And Dr. Metz -- I'm sorry. Go ahead and read us off.
THE VIDEOGRAPHER: The time is 12:33 p.m. and we are going off the record.
(Lunch recess was taken at 12:33.)

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A F T E R N O O N S E S S I O N
(Time noted: 1:05.)

THE VIDEOGRAPHER: The time is 1:05 p.m. and we are back on the record.
A L B E R T D I E D E R I C H M E T Z,
resumed as a witness, was examined and testified as follows:
CONTINUED EXAMINATION BY
MR. WEITZMAN:
Q. Sir, before our break I think you testified that you had reviewed the constituents of the S&P Metals and Mining Index before you signed your opening report. Is that correct?
A. Yes.
Q. And did you personally review those constituents or did you rely on your team to do that?
A. I believe I asked for a list of constituents as of some dates, I don't remember which ones, and they sent me the list.
Q. And would that be captured in an e-mail from your team to you?
A. Not necessarily.

Q. How would they have sent you the list of constituents?
A. It could -- we are going back in time. It could be on the -- on a share drive which I may have opened and looked at.
Q. Okay. Are you aware that Capital IQ did not include historical data for the constituents of the S&P Metals and Mining Index?
A. I don't have that personal awareness, no.
Q. You recall that Rio Tinto sent a letter or -- actually, let me withdraw that.
Are you aware that Rio Tinto sent a letter to the SEC requesting all documents and information you considered in preparation of your event studies?
A. I'm aware that there was some back-and-forth. I didn't get personally very involved in that back-and-forth.
Q. Did the SEC provide you a copy of Rio Tinto's and the defendants' request for all information that you considered in connection with your event study and opening report?

A. My recollection is that most of that interaction was handled by my case manager. Whether I saw the letter or not, I may have.
Q. Okay. You recall that -- withdrawn.
Are you aware that you or your team provided to the SEC, who provided to defendant, thousands of pages of documents that you considered in connection with your opening report?
A. I'm aware there was a substantial production of materials, yes.
Q. And are you aware that those materials do not include the list of constituents in the S&P Metals and Mining Index as of any dates relevant to your report?
A. No, I -- I don't have that awareness. I don't know exactly -- I didn't review the contents of the production, so I don't know.
Q. Okay. So do you have any explanation for why when the defendants asked for all documents you considered and reviewed in connection with your opening report and the event study therein, the constituent list of

the S&P Metals and Mining Index was not produced?
A. Again, I don't know that it was not produced. If it wasn't, I'd have to review the process particulars of what was produced, whether certain search criteria were produced that would generate such a list. I -- you know, I just -- I don't know.
RQ MR. WEITZMAN: Tom, we request supplemental production of any documents that Dr. Metz reviewed that reflect the constituents of the S&P Metals and Mining Index and the dates on which he received or reviewed those constituent lists.
MR. BEDNAR: Understood. Just memorialize your request after the deposition and we will respond.
Q. I think I earlier had asked you some questions about metal and mining companies comprising a certain percentage of the HSBC Global Mining Index. Do you recall that?
A. I'm sorry, sir. I was fixing my camera, which had frozen, while you were asking that question.

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A. Metz

Q. No worries.
Do you recall that I asked you before the break some questions about what percentage of the HSBC Global Mining Index was comprised of metals and other miners?
MR. BEDNAR: Objection. I'm not sure that you asked that.
THE WITNESS: Yeah.
Q. Okay. Well, Dr. Metz, are you aware -- have you studied what percentage of the HSBC Global Mining Index is comprised of metal miners?
A. The only information I have on that is what's reported in the fact sheet and I -- again, I wish I had reading glasses right now. I see diversified, gold, base metals, other -- what does that say?
Q. Other metals --
A. Other metals/minerals and coal. But I don't think I see a line item for metal miners specifically.
Q. But you are aware that the HSBC fact sheet does include information as to the constituents and the industries, relevant

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A. Metz

industries, market sectors that comprise the HSBC Global Mining Index; correct?
A. It certainly doesn't contain a list of constituents. I see that they have some percentages broken out by some industry categories that they have identified. I don't know the basis of their identification, if those are based on SIC codes or GICS codes or their own internal classifications. I have no idea what the basis of that is.
Q. So one of the criticisms you level regarding the HSBC Global Mining Index is something called endogeneity; is that correct?
A. Endogeneity, yes.
Q. Endogeneity.
A. Correct.
Q. And that's an issue that arises when the underlying index includes the subject company about which you are studying; is that correct?
A. Generally that's correct, yes.
Q. What percentage of the subject

companies -- let me rephrase that.
What percentage of an index is too

much for inclusion of the subject company to pose risks to skewing the results? Does that make sense? I may have phrased that poorly.
A. No, I --
Q. I can retry. Let me retry. Let's get -- let's get a good -- let's get a good question.
For the endogeneity problem to arise, is there a percentage of a subject company's inclusion in an industry index that is considered too much for purposes of using that industry index in an event study?
A. I'm not aware of any accepted guidance on at what point it's low enough that we can get -- get away with it. The problem arises because it's there. Whether --
Q. Okay.
A. -- it impacts a result that you are interested in, it's not something that you can really know ex-ante beyond perhaps obvious limits. Like if it's .000001 percent, I mean, you know, we don't have to be crazy, but -- but in general ex-ante you can't look at it and know that, oh, this is not going to affect a

result that I'm interested in.
Q. Well, let's take a hypothetical.
If Rio Tinto had comprised only 1 percent of an industry index, would you conclude that the endogeneity problem renders that industry index improper or inappropriate?
A. I would be concerned. I would want some assurances that it was not biasing my results or distorting my conclusions.
Q. And that includes -- withdrawn.
Does the endogeneity issue apply to market indexes too or just industry index?
A. The -- there is a general concern. Again, there can be a point at which it may not practically matter, but there is no guidance on what that point is.
Q. Okay. Does the general concern that you are referencing, does that include as well a general concern with respect to market indexes?

A. It would depend on the market index you are talking about. If you were talking about a value-weighted market index made up of a few names and Amazon and Apple were among

those names and Amazon and Apple were the company that you were looking at, I would be deeply concerned. If you were looking at --
Q. Okay. Okay. Understood.
You said you would want to test your concern to make sure that it didn't influence results by inclusion of the subject company. How would you do that?
A. Well, really the only reliable way to do it that I can think of right now, I should preface it that way, I mean, I -- you know, with more time I might be able to think of other ways, but sitting here today would be to reconstruct the index without the target company in it.
Q. So one could, for example, reconstruct the HSBC Global Mining Index without Rio Tinto, but with all the other constituents for the relevant time period; right?
A. One would, of course, require far more information than is available here. I suppose HSBC could do that, but --
Q. Well, did you consider doing that?

A. -- a consumer of these fact sheets could not do that.
Q. Let me pause.
Did you consider reconstructing the HSBC index to exclude Rio Tinto to determine whether endogeneity was a problem in this case?
A. I considered it for half a second until I realized I don't know the names of 180 out of 188 members of the index. I don't know how the index is put together. I don't know what prices are captured at what time from what markets. I mean, you couldn't begin to do it with the information that's here. It would be impossible.
Q. Is there no ability -- let's say you were tasked by the SEC to reconstruct the index. Would you be able to do so? Would you be able to reach out to any of these

aggregators, Capital IQ or Bloomberg, to purchase the constituent -- constituents of the index and recreate the index? Is that even feasible?
A. I -- I don't know. But, you know, it's not just --

Q. As you sit here today --
A. Just to be clear, it's not just the list of the names that are in there, though obviously that's a necessary point, but there are many other elements of how the index is put together that you would need to know, calculation methods, again, you know, what price is captured at what time of what day from what market. There are many things you would need to know to construct the alternative HSBC index excluding Rio Tinto.
Q. As you sit here today, you didn't make any effort to reconstruct the alternative HSBC Global Mining Index without Rio Tinto; correct?
A. It would have been impossible to even begin the exercise.
Q. Okay. And so without reconstructing it, you don't know whether endogeneity actually skewed the results of the event study; correct? You have identified a potential problem, but you don't know that it was a problem; is that fair to say?
A. It is -- it is enough to render the

results unreliable. You can't -- you can't put weight on the results when you know that such a, frankly, basic statistical problem is here with the potential to bias and render all parameter estimates inconsistent. I couldn't put any weight on the outcome of an analysis with HSBC. I wouldn't care what it showed. It might be favorable to me. I wouldn't put any weight on the outcome.
Q. You used the word that it had the potential to bias and render all parameter estimates inconsistent. You don't know whether it actually did. I just want to get that fact out there.
A. I'm glad you -- I'm glad you --
Q. You didn't confirm that it actually

did that; right?
A. Yes, I can, I know that it did, because it must have. It must have. The question one might ask is whether it would reverse a conclusion if you were to take Rio Tinto out. In other words, I have no doubt that if you took Rio Tinto out of the index, if someone were able to do that and re-ran the

analysis, you would get different parameter numbers coming out the other side. There is no doubt about that. It would be a cosmic coincidence of the highest order if you didn't get different parameter numbers coming out the other side. Then you might test it and you may or may not reach the same qualitative conclusion. But I don't know that you would. I have reason to doubt that you would. And I wouldn't rely on this index as currently constructed. It's improper to rely on this index as currently constructed for this exercise.
Q. Without reconstructing -- sir, without reconstructing the index, you don't know whether this issue of endogeneity affected, meaningfully affected the results of the event study, correct, whether it rendered something from statistically significant in one direction and it should have been in the opposite direction, a different finding; correct?
A. I know -- I know --
MR. BEDNAR: Objection.

A. -- that the model has a statistical problem. The basic assumptions which support linear regression and support all the statistical inference that one draws from linear regression are violated in this case. That's what I know.
Q. Sir, you are aware that Professor Hubbard also created an eight-firm peer index; correct?
A. Yes.
Q. And that eight-firm peer index did not include Rio Tinto as a constituent member; correct?
A. I was glad to see he didn't make

that mistake, yes.

Q. Are you familiar with the term "R-squared"?

A. I am.

Q. And is that generally understood to be an economic tool that evaluates how well a regression model predicts stock or ADR price movements?

A. Oh, no. No, I would not formulate it that way at all.

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A. Metz

Q. How would you define R-squared?

A. R-squared is -- measures the in-sample percentage of variation that your model explains. So that was a little technical. You have -- you have a dependent variable, something you are interested in. In this case Rio Tinto's ADRs. And you have independent variables, a market index and an industry index, and you want to ask a question, well, Rio Tinto ADRs move around a lot, it's got some variation. How much of that variation can I explain with strictly a linear combination of the factors in my model. Very interesting question to ask. R-squared answers that question. It's an in-sample measure of fit. Your question about prediction, of course, is an out-of-sample question. You predict things out of sample. And by no means is it true that a model with a higher in-sample R-squared is going to lead to better, more reliable predictions of things out of sample. That is what I objected to.

Q. What do you mean --

A. I'm not trying to be difficult.

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A. Metz

Q. What do you mean by R-squared measures fit?

A. That's the word that economists and other statisticians use. So, again, we would say the -- a measure of fit in terms of in sample, the predictions of the model versus the data, how closely do they correspond, that's a concept of fit, and R-squared is a measure of fit.

Q. Is it generally true that the higher R-squared number for an index, the better that index fits?

A. If -- by definition the higher the R-squared, the more variation in the dependent variable you have explained. Of course, statistically invalid models can lead to high R-squareds.
Q. Putting aside statistically, I am just -- statistically invalid models. I am just asking generally one would like an R-squared value that's higher rather than lower as between those two, the higher R-squared value is a better fit; is that correct?
A. A better fit. Again, I'd be very

careful. It does not mean it's a better model. You know, the guidance you will get repeatedly is we don't want to -- we don't want to search for the highest R-squared when we are selecting our models or selecting our variables. That can lead you down a bad path. I will answer your question this way: If I am satisfied with my variables and I think everything is good and healthy and statistically valid, I always like to see a higher R-squared coming out the other side than a lower R-squared, but that doesn't mean that I use R-squared to guide me in terms of variable selection or model construction. So I hope that distinction is clear.
Q. Okay. As between -- okay. I think that distinction is clear. Thank you.
In addition to the issue of endogeneity -- let me withdraw that.
In addition to the issue of endogeneity, you also objected to Dr. Hubbard's use of the HSBC index based on its susceptibility to non-synchronous price movement. Do you recall that?
A. I do recall that, yes.

Q. And just to understand what that means, stocks are traded in various locations around the world: The London index, the Australian index, the New York indexes; correct?
A. At least, yes.
Q. And the price of a given stock on a given day is generally recorded as its closing price; correct?
A. Generally by whom for what purpose?

Q. Well, in connection with your event study, do you rely primarily on closing -- closing prices?
THE COURT REPORTER: I'm sorry, sir.
A. I relied on --
THE COURT REPORTER: I'm sorry, sir. You broke up with that question. Can I have a repeat.
Q. In connection with your event study, you primarily relied on closing prices; correct?
A. For my event study in this case, I relied on well-defined closing prices, yes.
Q. And that's a scientifically accepted

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A. Metz

way of conducting an event study, to rely on closing prices; right?
A. It can be, yes.
Q. Are you aware that there are statistical methods that have been relied on in academic literature to take into account non-synchronous trading when analyzing stock returns?
A. I am aware of the study provided by Dr. Hubbard which attempts to address this problem for a different purpose. I'm not aware of a study which has a general solution for an event study of this type.
Q. Well, are you aware, sir, that there are multiple peer-reviewed articles in reputable journals that have resolved this non-synchronous trading criticism with the use of lead and lag terms?
MR. BEDNAR: Objection.
Q. Are you aware of that, sir?
A. I have not seen a peer-reviewed article that addresses the non-synchronous timing issues present in this case.
Q. Put aside present in this case. Are

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A. Metz

you aware that there are multiple peer-reviewed articles that have resolved non-synchronous trading issues through the use of lead and lag terms?
THE COURT REPORTER: I'm sorry, sir. You are breaking up. "The use of lead" --
MR. WEITZMAN: And lag, L-A-G, terms.

A. There are multiple peer-reviewed
articles that use lead and lag terms for
different purposes, yes. I don't know of one
that uses lead and lag terms for the purpose of
an event study of the type, not necessarily of
the players and particulars, but of the type
that we are discussing in this case.
Q. Have you reviewed those
peer-reviewed studies prior to your criticism
of Professor Hubbard's use of the HSBC index in
your rebuttal report?
A. Which studies? All studies? I
don't -- I'm not sure I understand the
question.
(Defendant's Exhibit 251, article
entitled Multimarket Trading and Liquidity:

Theory and Evidence, marked for
identification.)
Q. Let's turn to -- let's turn to
Exhibit 251. Are you familiar with this study
titled Multimarket Trading and Liquidity:
Theory and Evidence, offered by Baruch and
others?
A. Uh-huh.
Q. Did you review this before you
issued your report, your opening report in this
case?
A. No, I did not.
Q. Did you review this study before you
issued your rebuttal report? And I am asking
whether you personally read it.
A. Read every word of it? Actually in
this case I could say yes, I did.
Q. Okay. You are aware that in this
study Baruch and his co-authors used lead and
lag terms; correct?
A. They do use lead and lag terms, yes.
Q. And are you aware that they used the
lead and lag terms to account for
non-synchronous trading across markets in

different time zones?
A. For the purposes of this study, they
say that's what they are doing, yes.
Q. Okay. So they specifically -- just
so I understand correctly, they specifically
did use lead and lag terms to account for

non-synchronous trading; correct?
A. In an entirely different type of study from what we are discussing, yes, they did.
MR. WEITZMAN: Can we go off the record. I was booted off TSG, but now it's asking me for a key and it's not filling it in correctly.
THE COURT REPORTER: Okay.
MR. WEITZMAN: Actually, it will just take a minute. I think I have a key here, now that I look at it. I am trying to log back in. Okay. We can go back on the record.
THE COURT REPORTER: We are on.
Q. Sir, the Baruch study isn't the only study that relied on lead and lag terms to account for non-synchronous trading; correct?

A. I believe it's the only study cited by Dr. Hubbard in defense of his procedure.
(Defendant's Exhibit 252, article entitled Multi-country Event-Study Methods, marked for identification.)
Q. Okay. Well, let's turn to Exhibit 252. Are you familiar with this study by Multi-country -- if I can finish my question. Sorry.
Are you familiar with this study titled Multi-country Event-Study Methods by Cynthia Campbell and other co-authors in the Journal of Banking & Finance in 2010?
A. I have seen this, yes.
Q. Okay. Did you review this before you signed your rebuttal report?
A. Was this -- was this -- there are so many papers. Was this a paper cited by Dr. Hubbard in his rebuttal report?
Q. I appreciate you have a question of me, but it's -- I'm going to insist that I ask the questions and not provide information to you on that issue.
My question to you is do you recall

reviewing this study before you issued your rebuttal report?
A. I don't recall when exactly I reviewed this study.

Q. Okay. Was the other day -- was the past couple of days when we sent to you a copy of the exhibits the first time you recall reviewing this study?
A. I -- I don't recall if -- if or when I had seen this paper before I did my rebuttal report. I -- if it was cited by Dr. Hubbard, I did. If not, it's possible that I didn't.
Q. And are you aware that in this study the authors used lead and lag terms to confirm the validity of results that include non-synchronous trading?
A. Give me a moment, please. I'm sorry. I just need more time to refresh myself with this study. I'm not -- I don't remember --
Q. Let me direct your attention to page 12. Let me direct your attention to page 12 of the PDF. And can you just read to yourself Footnote 8. This is the page at the top it

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says 3089. It's page 3089 at the top of the document, and if you would turn to Footnote 8. You can read that to yourself and see if it refreshes your recollection.
A. Yes, I see that they do a robustness test where they introduce two leads and lags.
Q. And they concluded following that test that the lead and lag terms resolved concerns about non-synchronicity; correct?
MR. BEDNAR: Objection.
A. Again, I just need more time with this document to -- to render an opinion on what they found or what they didn't. It is possible that it may have resolved their concerns. That certainly doesn't necessarily mean that it resolves the concerns raised in this case.
Q. Fair enough. Why don't we move on.
The -- Dr. Metz, in your opening report you did not employ an alternative peer firm industry index in your regression model, you just used the S&P Metals and Mining Index; correct?
A. Correct.

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MR. BEDNAR: Objection.
THE COURT REPORTER: I'm sorry. The

answer?
A. In my opening report my event study results were based only on the S&P Metals and Mining Index.
Q. In your rebuttal report, you construct a 16-firm peer index for the first time; correct?
A. Did you say 15 or 16?
Q. 16.
A. 16. That's correct, yes.
Q. And is it fair to say that you did not construct a peer index for your opening report whether or not it was disclosed, meaning you didn't create a peer index and then decide not to use it in your opening report; right?
MR. BEDNAR: Objection. Vague. Do you have a definition for peer index?
Q. Sir, do you know when I refer to peer index, do you understand what I am referring to?
A. I did not construct any sector indices of my own construction that I assembled

myself for purposes of my opening report.
Q. You did do so for purposes of your rebuttal report; correct?
A. Correct.
Q. And the way you constructed your 16-firm peer index for purposes of your rebuttal report was that you included all of the firms that Rio Tinto listed in its remuneration report section of its annual reports from 2008 through 2014, excluding Rio Tinto itself?
A. Strictly speaking, my methodology was to use all of the firms identified by Rio Tinto during what I would call the period of interest, 2010 through 2013. That happens to correspond to the same set of companies you would get if you used all of 2008 to all of 2014. But my -- my methodology, my instruction, was to use the peers identified during the period of interest.
Q. And that 16-firm peer index incorporated the eight firms that Dr. Hubbard used when he created a peer index; correct?
A. That is correct.

Q. And it incorporated eight other firms; right?
A. Correct. Although if I recall, one of them didn't have available data to support the April 2011 event study, but I believe it did have available data to support the January 17th, 2013, study, so I just want to be clear on that.
Q. Now, if we can -- you didn't include in your rebuttal report the SIC, S-I-C, major industry groups for the 16 firms that you included in your peer index; correct?
A. That's correct.
Q. You didn't disclose the business descriptions of the 16 firms that you included in your peer index; right?
A. I believe that's correct, yes.
Q. Your report doesn't identify the R-squared value for your 16-firm peer index?
A. The report doesn't. I think my backup materials do, but -- but the report -- I don't think the report publishes the R-squared. I'd have to flip through it and see.
Q. Are you aware that the R-squared

value for your 16-firm peer index is lower than the R-squared value for Dr. Hubbard's eight-firm peer index?
A. On what day?
Q. On any day. Are you aware of that?
A. I'm aware that on --
MR. BEDNAR: Objection.
A. I'm aware that on April 8th there is a 0.6 percent difference in R-squared in favor of Dr. Hubbard's H 8, and on January 17th there is a 6 percent or greater difference in favor of Hubbard's 16 or my 16 version. So on April 8th they are virtually identical. On January 17th mine is noticeably higher.
Q. On January 17th both your event study and Dr. Hubbard's yielded the same results and conclusions, no statistical significance; correct?
A. That's correct.
Q. But on April 8th, there is a departure, you conclude that there is such a statistical significance and Dr. Hubbard concludes that there isn't; correct?
A. Correct.

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A. Metz

Q. Okay. In your 16-firm peer index, one of the constituents is Alcoa; correct?

A. You are testing my memory. I have the list in my report. I think that's right, but I -- we could look at the list in my report and be sure.

Q. It's not a trick question. I promise you. That's not -- I'm not inventing anything. I think it's conceded that Alcoa is one of them, but if you would like, we can turn to your rebuttal report. Is that important to you to see your rebuttal report to confirm that Alcoa is a member of your 16-firm peer index?

A. I would like to operate on good faith that if it's not a trick question, you are representing it correctly, but now I don't --

Q. You are aware, sir, that Alcoa has a SIC code of 33, primary metals industries; correct?

A. I didn't know that right now sitting here, but it doesn't surprise me.

Q. You are aware that Alcoa isn't considered a metal mining company like Rio

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A. Metz

Tinto; right?

A. I think of it as more of an aluminum --

MR. BEDNAR: Objection.

THE COURT REPORTER: I'm sorry, sir. Can I get the answer again, please.

A. Alcoa is often or by many described as an aluminum manufacturer, which, of course, is a -- is a business line of Rio Tinto's.

Q. Does Alcoa, to your knowledge, mine iron ore?

A. Not to my knowledge.

Q. Is it a mining company, to your knowledge?

A. It's -- I don't know offhand whether it has mining interests or not. It was identified by Rio Tinto as a viable peer for comparison purposes and I was simply following Dr. Hubbard's methodology. Whereas he focused on companies identified three years prior to the case, I just identified -- I just used the companies they identified during the case.

That's really the only difference.
Q. I'm sorry. What do you mean by

three years prior to the case?
A. Well --
Q. That Dr. Hubbard used mining companies three years prior to the case.
A. He used the set of eight published in the 2011 annual report, if I remember correctly, but that set of eight had been identified by Rio Tinto in 2008. They were not identified by Rio Tinto in 2011.
Q. Okay. I don't want to be -- I don't want to be nitpicky here, but to be clear, the set of eight that Professor Hubbard relied on were relied on by Rio Tinto in 2011 as the eight comparator firms for purposes of executive compensation; correct?
A. They made that determination in 2008 for a compensation plan, which I -- I'm going off my memory -- I think had a three-year vesting schedule, and so the outcome was realized in 2011 based on the decisions they made in 2008.
Q. I'd like to get a straight answer.
In the 2011 annual report Rio Tinto said that these are the eight companies, the

ones that Dr. Hubbard relied on, that it uses for comparison purposes for executive compensation; correct?
MR. BEDNAR: Objection.
A. I mean, we can open up the annual report. It does say that it -- one of its compensation plans, I don't know if it's its only compensation plan, was based on performance I think over a multi-year period which ended in 2011 and they used companies which had been decided upon before the performance began. So they selected the companies in 2008, tracked performance for three years. Based on that outcome they made certain determinations of executive compensation. It is not a particularly unusual practice. There were -- you know, we would have to go into it and look. Companies may have been selected in 2010 which they were then tracking in 2011 and 2012 and 2013.

Q. In addition to your reliance on Alcoa as one of the 16 peer firms, you also relied on Potash as one of the 16 peer firms; correct?

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A. Metz

MR. BEDNAR: I am going to object to the characterization.

You can answer.

A. Yeah, again, I'm simply following Dr. Hubbard's methodology. Dr. Hubbard says that peer comparisons identified by Rio Tinto for purposes of compensation are a valid basis for forming an industry index. I didn't say that. Dr. Hubbard said that. However, he chooses to only use a set of names that Rio Tinto had identified in 2008. You can talk about when they reported it, but they identified them in 2008 as being peers. All I did was say okay, if we want to do this, and I'm not particularly saying I endorse it, but if we want to do this, let's look at the peers they identified throughout the period of interest and see what we find.

Q. My question is a much more basic one. One of the 16 companies that you looked at was Potash; correct?

A. One of the 16 companies identified by Rio Tinto was Potash, yes.

Q. And you are aware that Potash is --

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A. Metz

actually, let me ask you this way. Withdrawn.

Do you know what SIC code Potash is in?

A. No.

Q. Would it surprise you to learn that it was in SIC code industry group 28, chemicals and allied products?

A. Neither surprised, nor unsurprised.

Q. Do you know what Potash does, what its business line is?

A. Used in fertilizer.

THE COURT REPORTER: I'm sorry, sir?

Q. It's not a metals mining company?

A. Again, I haven't --

MR. BEDNAR: Objection.

A. -- looked at Potash to see if they have any metal mining interests. Potash itself, I believe, is an ingredient in

fertilizer.
Q. You are not aware as you sit here today of Potash being a metals mining company; correct?
MR. BEDNAR: Objection.
A. I mean, I've answered it as best as

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A. Metz

I can. I don't know if they have any metal mining concerns. I haven't looked if they have any metal mining concerns. I don't think that's their primary line of business as many people would measure it, if they have any at all. But, again, I didn't select this. I am simply following Dr. Hubbard's procedure. He thinks -- he argues that if Rio Tinto identified them as a compensation peer, they are, therefore, valid to use as an industry control. I'm not saying I endorse that. In fact, my rebuttal report I go to great lengths to explain why that is not generally a great way to pick peers. And you might be stumbling on one of those reasons why this is not generally a great way to pick peers, but it is Dr. Hubbard's way to pick peers and I was just following it.
Q. Okay. That's all well and good.
Let me ask you this, Dr. Metz: Did you conduct a sensitivity analysis to determine whether the presence of these two companies, Alcoa and Potash, that are not mining companies, affected the outcome of your event

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A. Metz

study using your 16-firm peer industry index on April 8, 2011?
MR. BEDNAR: Objection.
A. I conducted a number of robustness checks against some types of inclusion and exclusion. I don't know if I checked particularly that exclusion. So I don't know if I checked that exclusion.
Q. If you were to learn -- withdrawn.
Would it surprise you to learn that if you remove Alcoa and Potash from your 16-firm peer index, the results on April 8th, 2011, would turn to not statistically significant for your event study?
MR. BEDNAR: Objection.
Q. Would that surprise you to learn

that?
A. I mean, obviously that's a hypothetical. There would be a lot of things to consider. I do know that this result is fragile to inclusion and exclusion. So, for instance, with Hubbard's eight, there are companies you can drop where he would -- the result becomes significant. To Hubbard eight,

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A. Metz

all you have to do is add Teck, which is a reasonable -- what many people might consider to be a reasonable peer, which is identified by Rio Tinto every year except 2011. If you simply take Hubbard 8 and turn it into Hubbard 9, you will find that April 8th is statistically significant. So I don't dispute that there are combinations of companies which might generate a result. But I am simply following the logic of the procedure Dr. Hubbard suggested, and if you follow that logic, you have to conclude that April 8th was a statistically significant abnormal return.
Q. Okay. I'd like an answer to my question, sir, and I will move to strike your -- your answer. My question is a different one.
Are you aware that if you remove Alcoa and Potash, that your event study would reflect -- or 14 firms instead of 16, it would reflect a non-statistically significant result on April 8th, 2011, do you know that, sir?
A. I do not know that and -- I do not know that.

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A. Metz

Q. And but you are aware that Alcoa and Potash are not in the same SIC code as other metal mining companies like Rio Tinto, you are aware of that, sir; right?
A. You have told me that. Of course, Alcoa as an aluminum manufacturer shares a certain overlap with an important business interest of Rio Tinto, so I don't know on what basis it would be appropriate to necessarily exclude Alcoa. They are both sensitive to aluminum prices and all the economics of the aluminum market. So you might be right that if I drop it, I might get a different result, but that -- I don't understand any argument why it

would be appropriate to drop.
Q. Would it affect your conclusions in any way regarding the market's surprise on April 8th, 2011, if you had run a sensitivity analysis that removed Alcoa and Potash and your event study now reflected that the 14-firm peer index it was not statistically significant for April 8, 2011, would that affect your conclusions?
A. No, not at all.

Q. And why is that?
A. Well, again, my conclusion is based on the appropriateness of the S&P metals and mining index, which I continue to believe is a perfectly appropriate index to use in this case. I wouldn't see any reason to drop Alcoa from my set of sixteen. It's an aluminum company. Rio Tinto has some substantial aluminum business, however you want to measure it, revenue or -- whatever measure you want, it does manufacture aluminum, so I don't know on what basis you would say it's inappropriate to include Alcoa. So we could have -- we could have an inappropriate index that gives a result, but that doesn't change my mind about what an appropriate index delivers.
Q. Alcoa is not in the same SIC grouping as metal miners like Rio Tinto. Do you dispute that, sir?
A. Again, I don't know that of my own knowledge. You have said that. I will accept that you are telling the truth.
Q. Prior to today when I said that, you had no clue what SIC code Alcoa was in, is that

your testimony?
A. "No clue" are strong words. I hadn't looked it up. I hadn't looked it up. It wasn't germane to my exercise of simply following Dr. Hubbard's logic to its conclusion. And, you know --
MR. WEITZMAN: We have been going about an hour --
A. -- let's not overstate -- I'm sorry. Let's not overstate how great it is to be in the same SIC code. There are other industry codes. I don't have an example offhand, but

I'm sure we could find companies that have the same SIC code, but a different GICS code and vice versa and different NAICS codes. I mean, people categorize these things differently all the time and you can tell me that Gold Corp is in the same SIC code as Rio Tinto. It doesn't necessarily mean that they are great peers. Rio Tinto has all exposure to gold, which I don't think ever shows up as a line item in any of its financials. Maybe it's a line item in some financials somewhere. Gold Corp is a gold company, and yet Dr. Hubbard wants to put them

together. You know, SIC code equivalence is not a standard for forming an industry index that I have seen in the peer-reviewed literature as though they have to be in the same SIC code and only in the same SIC code. It's a brand new standard.

Q. In choosing industry indices, whether it was the HSBC index or your 16-peer firm index, did you look at any of these codes, whether it's SIC or GICS or any other, to confirm whether the constituents of the index were in the same code as Rio Tinto?

MR. BEDNAR: Objection.

A. No.

Q. Did you do that analysis, sir?

A. It's not -- it's not an analysis that I think is necessary to conduct.

MR. WEITZMAN: If we can go off the record. We have been going about an hour.

THE VIDEOGRAPHER: The time is 2:02 p.m. and we are going off the record.

(Recess was taken from 2:02 to 2:11.)

THE VIDEOGRAPHER: The time is

2:11 p.m. and we are back on the record.

BY MR. WEITZMAN:

Q. Dr. Metz, do you recall that in Dr. Hubbard's report he explained that a general increase in stock prices across the mining sector on April 8, 2011, is attributable to an increase in metal prices that day?

A. I recall he makes an argument of that type. Obviously I don't remember the exact words he uses.

Q. And so he offered the increase in metal prices on April 8, 2011, as an alternative explanation for why there would be a statistically significant abnormal return on April 8, 2011; correct?
A. I would say he speculates that it might be. He offers no evidence that it is.
Q. And he offered that -- whether you classify it as speculation or otherwise, he offered that as an alternative explanation; right?
A. That -- can we be precise? As an explanation of what? What as an explanation of what?

Q. For the abnormal return that you found on April 8th, 2011.
A. An increase in spot -- some spot metal pricing.
Q. You agree with that --
A. I am just trying to clarify the question.
Q. That's his theory?
A. I -- again, without the words in front of me, I broadly accept that that was his theory.
Q. Okay. Can we turn to your rebuttal report, which is Defendant's Exhibit 225. And if you can turn to paragraph 93 on page 41.
A. Sorry. I have to switch binders. Bear with me. It's 225?
Q. Yes, Exhibit 225.
A. Okay. And then, I'm sorry, where in the document?
Q. Page 41, which is paragraph 93.
In paragraph 93 -- in the second sentence of paragraph 93 you -- it says: "Dr. Hubbard has offered no alternative explanation for why there would be a

statistically significant abnormal return on April 8, 2011." Do you see that?
A. Uh-huh.
Q. Is that a sentence you wrote or someone else wrote for you?
A. I don't remember specifically who wrote it.
Q. What do you mean by he offered no

alternative explanation, in light of the fact that in his report he explains that the abnormal statistical return under your model is attributable to an increase in metal prices on that date?

MR. BEDNAR: Objection.

A. No, no, no, no, no. Yeah, no, no, we are -- we are confusing things. He offers an explanation about why the sector rose and why -- and, again, this is his theory, not my theory, his theory. The sector rose because of metal prices, therefore, with a proper sector control you would get no statistically significant abnormal return. That's his argument. That's not an alternative explanation of why there is an abnormal return.

It's his explanation of why there isn't an abnormal return.

Q. Do you recall that just a moment ago I asked you whether Dr. Hubbard provided an alternative explanation for why there was an abnormal return under your model and you said yes? Do you recall I asked you that very question?

A. And I recall saying I don't have the words in front of me. I broadly remember an argument of that type.

Q. Sir, before you issued -- before you signed your opening report, did you consider whether changes in metal commodity prices on April 8th, 2011, could have confounded the results of your event study?

A. That's not standard procedure in an event study. Standard procedure is to have a market index and a sector index. The reason you have a sector index is to absorb all of these sector-type things. So it is not standard, not accepted practice that I have seen to say I'm gonna have a market index, a sector index, oh, and then I am also going to

start to add other things that might move the sector. It's not how these things are done. So no, I didn't.

Q. I am going to move to strike -- I am going to move to strike everything before "no, I didn't." Let me ask it to you again and ask

for a direct answer.
Before you signed your opening report, did you consider whether changes in commodity prices on April 8, 2011, could have confounded the results of your event study, did you consider it, yes or no?
A. Following standard practice, I did not consider it.
Q. You agree with me that testing for confounding news is standard practice in running an event study, is it not?
MR. BEDNAR: Objection.
A. Testing for what sort of confounding news about what?
Q. I'm just asking generally. One who conducts event studies using scientifically accepted and rigorous standards would look at confounding news to ensure that any

statistically significant return -- abnormal returns are not confounded; correct?
A. One would look for confounding company-specific news, yes. A rise in metal prices is obviously not company-specific news.
Q. So is it your testimony that if it addresses the industry as well as the company, it's no longer potentially confounding, is that your testimony?
A. As a general statement, yes, because that is why you have the industry sector in the model. It is redundant to have industry sector and other industry things, which is why I won't say nobody, but, I mean, I don't think I have ever seen anybody do that. Dr. Hubbard doesn't do that.
Q. And the reason you say this with the degree of certainty that you are saying it is because it assumes that you chose the right industry index, assuming you choose the right industry index, therefore, industry confounding news is not confounding on the stock; isn't that correct?
MR. BEDNAR: Objection.

A. I don't know -- you know, there isn't a right industry index. There are valid industry indexes and invalid industry indexes. So if we substitute the word "valid" for

"right," I would be inclined to agree with you.
Q. So if you chose an invalid industry index, therefore, if there were confounding -- if there were news in the industry, that could confound the results of your -- of your event study even if the news isn't solely specific to the company; correct?
A. I agree that if you have an invalid industry index, you have a poorly-specified event study, yes.
Q. Before you signed your opening report, did you take any steps to identify and disentangle confounding news on April 8, 2011, specific to Rio Tinto?
A. We reviewed the news of April 8th and news around April 8th and I don't think I'm aware of any confounding Rio Tinto specific news on April 8th.
Q. Were you aware before you signed your opening report about the commodity price

increases on April 8th, 2011, yes or no?
A. Yes.
Q. Would you agree with me, sir, that a general increase in metal prices on April 8, 2011, resulted in, generally speaking, an increase in demand for stock of metal mining companies?
MR. BEDNAR: Objection.
Q. Are you aware of that?
A. I'm not prepared to agree with that at all.
Q. Okay. Are you aware, sir, that analysts associated the increase in the mining sector on April 8th, 2011 with an increase in commodity prices?
A. I recall reading some analysts make that argument, yes.
(Defendant's Exhibit 258, Dow Jones Newswires, UK Summary: FTSE Closes Higher, Miners Lead, April 8, 2011, marked for identification.)
Q. We can turn to Exhibit 258.
Did you review this document before you signed your opening report?

A. Bear with me a moment. For the record, it is FTSE 30, not FTS 30. Clear that

up. I'm really not trying to be difficult. I reviewed so many documents at so many different points in time. I -- I just don't want to swear when I reviewed which document.
Q. Okay. Well, let me ask you this before we turn to this document. Are the -- are the news reports that you reviewed in connection with your opening report, are they listed out in your appendix?
A. They are not all individually listed in the appendix, no. The appendix lists the documents and news reports cited in the report and the broad search criteria that generates news articles considered.
Q. Okay. So if a news report is not cited in your report, it's not listed in the appendix?
A. That -- I don't know that that follows. The reverse follows. If it is cited in the report, it is listed. I mean, I haven't gone through to do a side-by-side to know if what you said is true. It may be. But I -- I

didn't check.
Q. Are you aware, sir -- are you aware, sir, that this article, the Dow Jones article, FTSE, F-T-S-E, Closes Higher, is not listed in your opening or rebuttal report or named in your opening or rebuttal report?
A. I don't have the list memorized, so I -- I don't know that. If you tell me that it's not, I'd be very happy to believe you.
Q. Okay. In the first sentence --
MR. BEDNAR: Counsel, if you are going to pose questions about the exhibit, can you display it, please?
THE COURT REPORTER: I'm sorry, sir?
MR. BEDNAR: Can you display the exhibit. Yeah, can you just display the exhibit.
MR. WEITZMAN: Defendant's Exhibit 258. I think there is a -- yeah, I think there is a bit of a lag. We are doing our best.
Q. In the first sentence, Dr. Metz, it says: "FTSE" -- F-T-S-E -- "100 ends higher, led by heavily-weighted mining stocks, on the

back of firm metals prices; Anglo American +3.9%, Rio Tinto +3.2%." Do you see that?
A. I do see that.
Q. And this paragraph -- this sentence notes that the increase in the FTSE 100 was led by the mining company and the metal price increases; correct?
A. I'm not being difficult. I assume that what you read is correct. I was kind of clearing my throat while you read it, but I -- so I apologize.
(Defendant's Exhibit 259, The Wall Street Journal, Miners Drive Europe's Gains, 8 April 2011, marked for identification.)
Q. Let's turn to Exhibit 259. This exhibit is an article from the Wall Street Journal titled Miners Drive Europe's Gains, April 8, 2011.
A. I see that.
Q. You did not cite -- you did not cite this article in either your opening or rebuttal report. Are you aware of that?
A. I have to give the same answer. I

haven't memorized the list of articles that I have cited in either of my reports.
Q. In the first sentence it states: "European markets advanced Friday, buoyed by solid gains for the mining sector as metal prices rose once again." Did I read that correctly?
A. You did read that correctly. Further down: "Miners advanced, helped by news that Rio Tinto had clinched a majority interest in long-pursued Riversdale." So I guess that settles the case.
Q. Case closed, huh?
What analysis did you conduct in connection with your opening report to rule out the possibility that increased commodity prices were the result of the abnormal returns on April 8, 2011?
MR. BEDNAR: Objection.
A. I think you mean to say were they the cause of the abnormal returns on April 8th. I don't want to be unfair, but I assume that's what you meant.
Q. It is. Thank you.

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A. Metz

A. Well, the analysis I conducted was to include a valid industry index in my model, confirm that my model was statistically satisfactory, and run the event study. I didn't conduct an auxiliary analysis specifically around commodity prices, because, of course, that's not standard procedure.

Q. Is there any analysis that you could have conducted to determine whether the cause of the abnormal returns was the metal mining increase?

MR. BEDNAR: Objection.

A. I -- I would have to think about that.

Q. Can -- I'm sorry, sir. It's been six months since you submitted your opening report.

Have you at any point in time in the past six months thought about how you can construct an analysis, whether it's an event study or some other analysis, to rule out the possibility that the abnormal returns on April 8, 2011, in your regression analysis were the result of an increase in metal prices, did you

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A. Metz

think about this --

MR. BEDNAR: Objection.

Q. -- over the past six months?

A. Oh, yes. And I have --

Q. Okay. What --

THE COURT REPORTER: I'm sorry. I'm sorry. The witness was speaking. I'm sorry, sir.

A. Yes, I have thought about that question.

Q. Okay. What analysis could have been conducted to rule out the possibility that metal price increases on April 8, 2011, were the actual cause for the statistically significant abnormal returns that you identified on April 8, 2011?

A. I don't know what I would do or -- I haven't thought about that question.

Q. As you sit here today, you can't -- you can't identify how one would rule out or conclude one way or another whether metal mining price increase -- whether metal

increases -- sorry.
As you sit here today, you can't

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A. Metz

conceive of an economic analysis that would identify whether the metal price increases on April 8, 2011, were the cause of the abnormal returns you identify in your model?
MR. BEDNAR: Objection.
A. I mean, it's a -- it's a -- it's a complicated question. Again -- and I'm sorry for not giving you your yes or no answer, but this is a complicated question. Typically what we do is put an industry equity index into the model. We don't put those things that might drive industry equities into the model. We put the equities themselves. That's standard. You will find it in essentially any reference you want to check. There is a reason people do that. There is a reason people put an equity index to represent the sector and not things they think might drive equities in a sector into a model. I am comfortable that my abnormal return is independent of the things that drive equity returns in the sector. You are asking can I decompose the things that drive equity returns in a sector between metal prices, interest rates, regulation. I mean,

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A. Metz

you know, we could sit here and list a million things that might move equity prices in a sector. So, I'm sorry, but I have not thought through exactly how I would decompose and isolate spot metal prices, a few spot metal prices from all the other things that can move equities in a sector. I just haven't thought about it. It's sort of an academically interesting question. Maybe somebody someday will take you up on it. I haven't thought about that. If you don't mind, I'll write it down. Maybe I'll research it and I'll cite you as inspiration.
Q. Sorry. Just give me a second, please.
Did you do anything to segregate or disaggregate the extent to which Rio Tinto's ADR price increases were the result of metal price increases or gaining control of Riversdale?

MR. BEDNAR: Objection.
A. Again, to the extent that metal prices are relevant here, they are captured by the industry sector. So no, I -- not even --

no, I didn't think of trying to disaggregate metal prices from anything else that might move the industry sector.
Q. Are you aware, sir -- I think we testified -- you testified about it earlier. Many of the constituents of the S&P Metals and Mining Index moved in opposite directions in the mining companies on April 8 due to the increase in metal price -- metal prices on April 8, 2011. Do you recall that?
MR. BEDNAR: Objection.
A. I don't recall that.
Q. You recall that you testified earlier today about doing a correlation analysis between metal mining companies and metal manufacturers?
A. I recall doing a correlation analysis between Rio Tinto and eight steel companies that Dr. Hubbard had identified in his report as being problematic.
Q. The eight steel companies that he identified in his report as being problematic, those are eight steel companies that are included within the S&P Metals and Mining

Index; correct?
A. Yes, they are certainly included as of April 8th. You know, we haven't checked every day whether they are included, but they are included as of April 8th, yes.
Q. And you confirmed, sir, did you not, that those eight steel manufacturers, their stocks declined on April 8th, while Rio Tinto's increased on April 8th; correct?
A. I didn't say that in my testimony. I do recall seeing that in one of the updated exhibits.
Q. And you confirmed that to be the case as part of your correlation analysis, you noticed that; correct?
A. Again, I'm not -- I'm not gonna dispute it, but I -- I don't -- I don't know that literally through the course of today I

confirmed it, but I'm not gonna dispute it. I think it's true.

Q. Okay. And those were eight companies that were included in the S&P Metals and Mining Index; correct?

A. Correct. Appropriately so, in my

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opinion.

Q. And did you do any analysis to determine whether the results of your event study would have changed on April 8th, 2011, had you used stocks in your industry index that did not include steel manufacturers?

A. Yes. In preparation for today's deposition.

Q. What analysis did you do?

A. Several. Let's see. In the first instance, I asked the question what would happen if the value of the S&P Metals and Mining Index as reported -- the return to it as reported on April 8th, which if memory serves is minus 0.4 percent or something like that, it's in my report, but it's a negative number, what if instead of using that value, which is based on all of the constituents of the S&P Metals and Mining Index, what if we calculated what the value would be if we only used the eight companies in SIC group 10. And if you take an equal weighted average of their returns on April 8th as reported in the updated Appendix C, I don't know what exhibit number

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that is, but it's one of the exhibits that you sent over, taking those numbers as given, and I don't think I independently checked whether they are correct, but taking those numbers as given, take an equal weighted average of those and you get a number of plus 1.02 percent. So what happens if the S&P Metals and Mining Index return on April 8th instead of being negative whatever it was was instead positive 1.02 percent based only on SIC 10 companies and ignoring everything else, April 8th is still significantly -- still statistically significant positive abnormal return at the 5 percent level. The result is completely robust to that change. Another thing I did --

Q. Sorry. Can I pause you right there,

sir.
A. Sure.
Q. Just I can't -- I've got to ask you some questions before I forget them. I apologize.
Did you conduct that analysis before your rebuttal report?
A. No. I conducted that analysis in

preparation of today's deposition when I saw the updated appendix --
Q. When -- when specifically did you conduct --
THE COURT REPORTER: I'm sorry. I'm sorry, sir. The witness. "When I saw the" --
A. When I saw the updated appendix, I don't remember what it is, P-4, whatever the updated appendix which lists the constituents of the S&P and their returns on April 8th.
Q. You saw that document that you are referring to this past weekend?
A. That sounds correct.
Q. So the first time you conducted this analysis was within a few days of your deposition?
A. Correct.
Q. Okay. Why don't we come back to this then. Do you have work product on that analysis?
A. Yes.
Q. Is there a reason you didn't produce it before your deposition?

A. We hadn't discussed it and it hadn't been asked for.
Q. Do you understand, sir, that you have a duty to disclose to the other side all of your opinions and analyses in this case?
MR. BEDNAR: Objection.
A. I under- -- I understand I have a duty to provide documentation in support of the opinions in my expert reports. I conducted this analysis to answer a question. If you would like us to turn over the work product -- I don't want to speak for the SEC.
Q. Had I not asked you this question, no one would know you conducted this

supplemental analysis, is that fair to say?
A. Possibly. Because, of course, it doesn't change any of my opinions. I never shared Dr. Hubbard's concern about combining steel companies with these others in an industry index. It's very standard. It's very common to do that. It makes a great deal of economic sense. I never had any -- I never had any principled concerns to doing it. Dr. Hubbard raised some, which were

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interesting, and I wanted to confirm that my intuition was correct that -- not just my intuition, but typical market convention to combine these companies together was a reasonable and valid thing to do.
Q. Sir, you -- as part of your opening report you conducted an efficient market analysis for Rio Tinto; correct?
A. Yes. Rio Tinto ADRs, if you want to be hyper-precise, but yes.
Q. You concluded that Rio Tinto ADRs traded in an efficient market; right?
A. At least during the period of interest, yes.
Q. And how quickly can you expect new publicly-available information to be incorporated into the ADR price of Rio Tinto as a result of your analysis?
A. An interesting question. I don't know that there is an agreed-upon standard. People use words like "quickly" without really defining what quickly is. It's -- it's common practice to assume that within a day's trading the effect of the information should be there.

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That's the practice I followed. Could it be there within five minutes? I -- I haven't tested that. I haven't ruled that in or out, but I was comfortable using a day window as sufficient time for news to be reflected in prices, which I think is fairly typical in the literature.
Q. So the closing price of Rio Tinto's ADR on any given day would already price in new publicly available information released the prior day; is that fair to say?
A. That sounds -- that sounds fair to

say, yes.
Q. And is it fair to say then that the abnormal return that you identified for Rio Tinto's ADR on April 8, 2011, should reflect only the new information that became publicly available after the market closed on April 7th, 2011?
A. That's the assumption under which I formulated the event study, yes.
Q. Okay. In your opening report, Dr. Metz, it was your opinion that following the announcement in December 2010 that Rio

Tinto would pursue an acquisition of Riversdale, that there was a high degree of uncertainty that Rio Tinto would succeed in acquiring Riversdale; is that correct?
A. If you want to put the words in front of me. I probably said something like that. I'm not gonna swear that's a direct quote. I don't have it in front of me.
Q. Okay. Well, why don't we take a look at your direct quote then. Could you turn to the opening report, which is Defendant's Exhibit 212, and you can turn to paragraph 57.
MR. BEDNAR: Avi, I think we may have lost you.
THE COURT REPORTER: I'm sorry?
MR. BEDNAR: I think we lost defense counsel again.
THE VIDEOGRAPHER: Do you want to go off the record?
MR. WEITZMAN: Can you see me or hear you?
THE WITNESS: I hear you.
MR. BEDNAR: We hear you. We are comfortable going on as long as we are able

to understand you.
MR. WEITZMAN: I'm sorry. Can you not see me?
MR. BEDNAR: No, we can't.
THE WITNESS: No.
THE COURT REPORTER: Do you want to go off the record?
MR. WEITZMAN: I'd rather not. I'd rather continue. It says that I'm still logged on and I'm seeing myself. Do you

see me, Kristin?
THE COURT REPORTER: No.
THE VIDEOGRAPHER: Do you want to go off? I'm sorry.
MR. WEITZMAN: Why don't we continue, if possible.
Q. Paragraph 57, Dr. Metz, in paragraph 57 in the second sentence you stated that after the December 2010 announcement, quote: "There was a high degree of uncertainty that the Company would succeed in acquiring Riversdale." Did I quote you correctly?
A. Yes.
Q. It was your opinion in your opening

report, sir, that analysts believed Rio Tinto faced substantial obstacles to acquiring Riversdale from the time it made the formal offer on December 4th, 2010, until April 8th; is that correct?
A. It was my opinion that some analysts did, yes.
Q. Can you turn to paragraph 58 of your report.
A. Uh-huh.
Q. In paragraph 58 you stated that between December 4th, 2010, and December 21, 2010, analysts explained that Rio Tinto faced -- I'm sorry. I am misreading this. You stated that -- it went back on now. Withdrawn.
In paragraph 58 you state: "Thus, even though Rio Tinto made a formal offer for Riversdale on December 4, 2010 and raised its bid on December 21, 2010, analysts explained that Rio Tinto faced obstacles to gaining control of the Riversdale mining assets." Did I read that correctly?
A. You did.
Q. And you concluded --

A. There is a typo in that sentence.
THE COURT REPORTER: I'm sorry, sir, the witness. One more time.
A. I just -- I just realized there is a -- there is a typo in that sentence and I apologize. Where it says "formal offer," it should say "informal offer." I hope that's not the source of your question or confusion.

Q. It is not. Thank you very much.
You believe -- you concluded in your opening report that the news on April 8th, 2011, that Rio Tinto had acquired control of Riversdale was a positive surprise; is that correct?
A. Correct.
Q. Now, in your rebuttal report you state that analysts and the press believed that it was likely that Rio Tinto would eventually gain control of Riversdale as early as December 7th, 2010. Do you recall that?
A. I recall saying some analysts expressed that opinion. The point is that you have got analysts raising concerns, but if you want to, you can find analysts who are very,

very bullish and very, very optimistic.
Q. And did you -- you included in your -- if we can turn to your rebuttal report, which is Exhibit 225 and turn to page 26, paragraph 56.
A. Paragraph 56.
Q. In paragraph 56 --
A. My rebuttal report, yes.
Q. In paragraph 56 you state that: "Appendix IV.B further documents additional predictions and corresponding frustrations over the complete timeline with a larger selection of media commentary." Do you see that?
A. Yes.
Q. And so is it fair to say that in your rebuttal report you identify that between December 2010 and March 2011 at various times the market had high expectations that Rio Tinto would successfully acquire Riversdale?
A. I document that throughout that period one can frequently find analysts who are very bullish that Rio was going to acquire Riversdale. Of course you can find analysts who are quick to point out all the obstacles to

Rio acquiring Riversdale. I don't -- in other words, I don't know if I would characterize it as there is a period of time where everybody is optimistic and a period of time where everybody is pessimistic. I don't think I am prepared to frame it that way. Throughout the process you

can find somebody who says, 'wow, you know, they are gonna get it, this is great,' and you can -- if not literally the same day, in the neighborhood, you can find somebody who says 'here are all the reasons why this is gonna be difficult.'

Q. So did you conduct any market analysis or economic analysis to determine whether there were abnormal returns on those days when analysts in the market had high expectations that Rio Tinto would succeed in its acquisition plan?

A. No.

Q. Did you conduct any market or economic analysis to determine whether on those days between December 2010 and March 2011 when the market was disappointed or had frustrations that Rio Tinto had not succeeded in its

acquisition plan when there were statistically significant abnormal returns for Rio Tinto's ADR?

MR. BEDNAR: Objection.

A. I am trying to understand your question. Quite literally we conducted an event study every day and those results are in our backup materials. I didn't review them carefully, because they weren't really germane to my opinion that on April 8th there was a statistically significant positive abnormal return. So I'm trying to thread the needle, because technically, yes, we conducted these event studies, but did I investigate them in this report in sort of a deep way, I didn't see the need to do that.

Q. You agree that there was no abnormal price movement in Rio Tinto's ADR in response to the initial news that Rio Tinto would seek to acquire Riversdale in December 2010; correct?

A. That's correct. I believe I make that point in my report.

Q. Is it -- is it common or rare, in

your experience, that there would be a large market reaction to news of the completion of an acquisition, yet no market reaction to news of the acquisition offer, is that your experience?

A. I have never conducted an analysis to tabulate the frequency with which markets react at different points in the process. And whatever you found, whatever average result you found, you know, case by case could be very different, so I'm not sure the value of such an analysis.
Q. Can you identify a single example in business or economics where the market so valued the acquisition upon the completion of control, yet did not react to news of the acquiring company's offer?
A. Besides this one we are talking about?
Q. Can you cite one other example?
THE COURT REPORTER: I'm sorry. You over-spoke.
Q. Yes.
THE COURT REPORTER: I'm sorry. I didn't hear the witness' response.
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A. I just was clarifying if the question was in addition to the case we are talking about. I haven't checked or looked on that question.
Q. You are not familiar of any academic -- you are not familiar of any academic literature, are you, sir, to support that the value of control could be so massive upon the acquisition and yet so negligible upon the offer to acquire, are you?
MR. BEDNAR: Objection.
A. I don't even know how to unpack that question. There is -- there is a lot of literature on the value of control. There is a great deal of literature on event study. There is an understanding of markets react to news and perceptions of news. So yes, one can put all of that literature together and perfectly understand why if a company on Monday says 'I want to buy this other company,' the market might look at that and say 'good luck,' but then by the time it gets to it and they have done it, you know, the market could say 'great, we are really glad you did it.' I mean, it's
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hardly an unusual set of economics that would generate that result. The frequency with which

that's happened in the entire history of mergers and acquisitions, I certainly haven't done an analysis of that. I don't know anyone who has.

Q. And while you say it's not an unusual event, you can't name an additional -- any other example in the history of mergers and acquisitions where that is the case; is that fair to say?

MR. BEDNAR: Objection.

A. I don't believe I -- I'm sorry. I don't believe I said it's not an unusual event. I think I said it's not an unusual set of economics that could generate such an event. I think that's what I said. I don't know that the frequency --

Q. You couldn't name --

THE COURT REPORTER: I'm sorry, sir? The witness.

A. I can't -- I can't -- I don't know the frequency of events of that type beyond, of course, the case that I've looked at and the

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case we are discussing.

Q. Sir, you are aware that there is an entire body of literature in the merger and acquisition context that evaluates the value to the acquiring company at the time of the announcement rather than the obtaining of control, are you aware of that?

A. I'm aware there are many studies conducted along those parameters, yes.

Q. And the reason those studies look at the value upon the announcement is because typically the announcement itself of the offer generates value or results in stock price movement; correct?

A. No. I would be very careful --

MR. BEDNAR: Objection.

A. I would be very careful about characterizing it that way. The -- the acquisition potentially creates value, if it's a value -- if it's a value-creating acquisition, and let's just presuppose that's what we are discussing, value-adding acquisition. In many cases when somebody makes an announcement, when firm A says 'I intend to

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buy firm B,' many people may be of the opinion, okay, firm A is gonna go buy firm B, that's great, I like firm A, I am gonna go buy its stock. I'm not surprised that that happens with some frequency. People don't often set out publicly -- I should be very careful. I haven't done the analysis. I don't know how often they do it. I could imagine that companies don't want to go out publicly and say 'we are gonna go buy this company' and set themselves up for failure and not buy it. So, you know, those studies are all fine and all good and it's a -- it's a fine thing to study. In this particular case there are some unique facts. 47 -- not at the time of the announcement, but then soon after 47 percent of the stock was essentially out of the hands -- out of grabs from Rio Tinto. This was gonna be a tough acquisition. So this is the case we are talking about and this is what the facts show.

Q. Have you previously published on the issue of M&A deals and using event studies to value the effect that abnormal price increase

of mergers and acquisitions on acquiring companies, did you ever publish on that topic?

A. I don't recall that I have ever published on that topic, no.

Q. On March 29, 2011, Rio Tinto announced that it was restructuring its bid for Riversdale; correct?

A. It announced some changes to the conditions of the bid, yes.

Q. And one of the changes was that it made its offer unconditional; right?

A. That's my understanding, yes.

Q. And the reason for that change was because it wanted to increase the likelihood that it would acquire control of Riversdale; right?

MR. BEDNAR: Objection.

A. Yeah, I mean, I -- I think it's -- many people think that's why they did it. It's certainly reasonable that that might be why they did it. You know, I wasn't in the room at the time to know why they did it, but yes.

Q. It was understood, sir, by the market that by making the offer unconditional

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on March 29, 2011, Rio Tinto would be able to buy additional stock from hedge funds and index funds as well as Riversdale's board members; right?
A. That I agree with, yes.
Q. And it was understood, sir, was it not, that that would increase the likelihood that Rio Tinto would succeed in its bid?
MR. BEDNAR: Objection.
A. Likelihood held by who for some purposes? I mean, if you asked me, I would say I think that that increases the likelihood. Maybe somebody else has a different opinion. I don't know.
Q. Your event study, sir, found that there was a positive 1.3 percent abnormal return on March 29, 2011; isn't that correct?
A. I don't remember the number I found.
Q. Okay. Let's turn to paragraph -- I'm sorry. Well, do you -- let me withdraw.
Do you recall, sir, that on March 29, 2011, your event study concluded that the abnormal return was not statistically significant?

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A. Yes, I do recall that.
Q. Okay. So is it fair to interpret your event study that the market was indifferent to Rio Tinto changing the structure of its bid on March 29, 2011, is that what that means?
A. I -- I don't know that that's what that means. I simply didn't find a statistically significant abnormal return that day. You know, to -- as you know, the absence of evidence is not always evidence of an absence. I didn't do a particularly deep dive. If there was some negative event on March 29th it might have needed it. I didn't -- I didn't feel the need to go look for that. I'm not saying there was. I just -- I didn't feel the need to look for it. So maybe, but I -- you know, I -- I wouldn't -- let me put it this way. Simply based on the fact that there was no significant return that day, that wouldn't be enough for me to say, well, therefore the market didn't care. I think you would need

more than that.
(Defendant's Exhibit 263, Financial

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Review, Rio Makes Move on Riversdale, 30 March 2011, marked for identification.)
Q. If you can turn to Exhibit 263. This is an article dated March 30, 2011, in the Financial Review titled Rio Makes Move on Riversdale. Do you see that?
A. I do.
Q. And in the middle of the page it states: "Rio is expected to pull in 5 per cent to 6 per cent of Riversdale stock now held by index funds, to help lift its stake above 47 per cent." Do you see that?
A. I do see where it says that, yes.
Q. And if you turn to the last paragraph on the page, it states: "The shedding of conditions means Rio will now pick up shares belonging to Riversdale board members who had recommended the proposal." Do you see that?
A. I see where it says that, yes.
Q. Based on your review of this document, is it fair -- do you agree that the market understood the March 29, 2011, changes in the structure of the bid to increase Rio

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Tinto's likelihood of success in acquiring Riversdale?
MR. BEDNAR: Objection.
A. I see that whoever wrote this article is of that opinion.
Q. Okay. April 6, 2011, sir, was an important day in Rio Tinto's efforts to acquire Riversdale, was it not?
A. Important to whom in what way?
Q. Well, are you aware, sir, that on that day, on April 6, 2011, Rio Tinto had acquired 49.49 percent of Riversdale's outstanding shares?
A. That sounds correct, yes.
Q. You mentioned that in your rebuttal report, in fact; right?
A. I very well may have. It sounds familiar.
Q. But that's not all that happened on April 6, 2011, sir, is it?

A. You are perhaps referring to the appointment of some board directors?
Q. Well, isn't it a fact, sir, that Riversdale's board itself issued a press

release that it unanimously decided to recommend that its shareholders accept Rio Tinto's offer to acquire their shares on April 6, 2011?
A. Yes, as they had done many times before.
Q. And isn't it a fact, sir, that in that same press release it was publicly announced that Riversdale had appointed Rio Tinto's three nominees to Riversdale's board of directors?
A. I am going by my memory of what's announced on what date. Maybe we could have the document in front of us. You are probably right that that happened on April 6th, I seem to recall that, but we are -- we are going off my memory here.
(Defendant's Exhibit 265, Riversdale Mining Media Release, 07 April 2011, marked for identification.)
Q. Okay. Well, why don't we turn to Exhibit 265. This is the press release we are talking about; correct?
A. I imagine this is the press release

you were talking about, yes.
Q. Had you reviewed this press release before you got Rio Tinto's exhibits for this deposition?
A. I had certainly reviewed press releases with substantially the same information. Whether it was literally this one or not, I -- I don't want to say.
Q. Okay. And at the top of the press release it's dated April 7, 2011, Sydney. Do you see that?
A. Uh-huh, I see that.
Q. You understand that to be a reference to Sydney, Australia?
A. I would presume so, yes.
Q. Okay. And you know that Sydney, Australia is 14 hours ahead of New York, are you aware of that?

A. That sounds -- yeah.
Q. Okay. And so do you know that the -- this press release that was issued in Sydney on April 7th was actually reported in New York on April 6th, are you aware of that?
A. I think my timeline confirms that.

(Defendant's Exhibit 267, Dow Jones Newswires, Riversdale Mining: Appoints Three Rio Tinto Nominees to Board, 6 April 2011, marked for identification.)
Q. Turn to Defendant's Exhibit 267. This is a copy of a Dow Jones Newswire dated April 6, 2011, at 8:26 p.m.
A. Uh-huh.
Q. This reflects the contents of -- by and large, the contents of that press release issued by Riversdale; right?
A. By and large, yes.
Q. Okay. So by April 6th there was news about Riversdale recommending that its shareholders accept Rio Tinto's bid; correct?
MR. BEDNAR: Objection.
A. As it had done many times before. I don't know if I would characterize it as news. They have always been supportive of the bid.
Q. What's your basis for saying that they were always supportive of the bid?
A. I think my report cites commentary and media reports back to December, January, I would have to have it in front of me, but

certainly prior to this date where the board recommends shareholders accept. This wasn't the first time.
Q. Well, sir, the press reported that the news on April 6th made it a near certainty that Rio Tinto will end up owning more than half of Riversdale shares; correct?
MR. BEDNAR: Objection.
A. You can find press reports written by people who are of that opinion. It's hardly a fact.
Q. And they reported that on April 7, 2011, while the market was trading on April 7; correct?
A. I don't remember the exact timestamps, but some markets were trading, yes.

Q. Okay. And you recall that Rio Tinto on April 7th, 2011, reached 49.49 percent ownership of Riversdale, do you recall that?
A. You know, that's an interesting question, because this document, for instance, says 49.53. So --
Q. Okay. So it was --
A. So one review of the data

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suggests that through the course of trading they went all the way from 49.49, all the way to 49.53.
Q. On April 7th; correct?
A. April 6th, April 7th, something like that.
Q. There were many commentators, sir, who believed on April 6th, April 7th that it was inevitable that Rio Tinto would take control over Riversdale, isn't that fair to say?
MR. BEDNAR: Objection.
A. What -- what's -- what's many? I mean, do we have -- do we want to have an example of one who says inevitable? There might be one. Might be more than one. But do we have an example?
(Defendant's Exhibit 269, The Australian, Late Surge Puts Rio in Driver's Seat on Riversdale, 7 April 2011, marked for identification.)
Q. Turn to Exhibit 269.
A. Yes.
Q. This is an article on April 7th,

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2011, in The Australian stated Late Surge Puts Rio in Driver's Seat on Riversdale. Is that correct?
A. Yes, I see that.
Q. And in the fourth paragraph it states: "It is now a near certainty that Rio will end up owning more than half of Riversdale's shares." Correct?
A. Yes, and I -- I'm interested in the next sentence: But even if it does not. So, okay, a near certainty, but let's talk about what happens if it doesn't. So, you know, yes, I -- to your -- to your general point, are there people at this point in time extremely

optimistic that this acquisition is going to succeed? I don't deny for a moment that there are people extremely optimistic that this acquisition is going to succeed, but whether that means the market knew is -- is a leap and not supported by the evidence.
Q. Let's read the entirety of that sentence, not just the first part of it.
A. Okay.
Q. Defendant's Exhibit 269. It says:

But even if it does not, the 49.49 per cent stake will ensure it is nearly impossible for Riversdale's two other big shareholders, which hold a combined 47 per cent, to block Rio's intentions to develop the Riversdale mines the way it wants. Do you see that?
A. Uh-huh. I do.
Q. This article viewed the 49.49 percent ownership stake as giving Rio Tinto effective control over Riversdale; correct?
A. This article, yes, is suggesting that at 49.49 Rio has effective control. Obviously it doesn't have technical formal control. But finding an article that says that and finding people of that opinion, I don't deny there were people of that opinion. I don't deny it.
Q. But, Dr. Metz, it wasn't just this article --
A. But you are trying to say the market was of that opinion. The evidence doesn't bear that out.
Q. Dr. Metz, it's not just this

article. There were many, many articles, were there not, on April 7th that interpreted what happened on April 6th and April 7th as giving Rio Tinto effective control over Riversdale; isn't that correct?
A. There are --
MR. BEDNAR: Objection.
A. I don't know what many is. I don't know the standard for many. There are -- there are also several articles published on April 8th announcing, trumpeting, signalling the big deal that Rio had acquired Riversdale. So we

can -- we can do this, but --
Q. Sir, I'm sorry, this is my deposition, sir, so --
A. I apologize.
(Defendant's Exhibit 270, Financial Times, Rio Tinto Grabs the Reins at Riversdale, 7 April 2011, marked for identification.)
Q. Exhibit 270. On Exhibit 270 this is an article in the Financial Times dated April 7, 2011; correct?
A. It appears to be, yes.

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Q. And do you recognize the Financial Times as one of the most well-read financial newspapers in the world?
A. I imagine it is. I am not gonna quibble on that.
Q. And in the first sentence it says: "Miner Rio Tinto has in effect taken control of Riversdale Mining." Correct?
A. It does say that.
(Defendant's Exhibit 271, Herald Sun, Rio Builds Up Stake, 7 April 2011, marked for identification.)
Q. Let's look at the next document, Exhibit 271. This is an article in the Herald Sun dated April 7, 2011, titled Rio Builds Up Stake. In the first sentence it says: "Rio Tinto is poised to snare control of its $3.9 billion target Riversdale Mining after amassing a 49.49 per cent stake in the coal miner." Did I read that correctly?
A. Yes. It seems to be objectively true.
Q. Sir, what analysis -- withdrawn.
Your event study using your industry

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index found that there was no statistically significant positive abnormal return on April 7, 2011. Isn't that correct?
A. That is correct.
Q. That would mean, if I understand it correctly, that the market, according to your analysis, did not perceive the event starting on April 6th and the acquisition of effective control on April 7th to have been accretive to Rio Tinto; is that correct?

MR. BEDNAR: Objection.
A. Again, with -- with the allowance that maybe there was some other negative information out there I'm not aware of, that's essentially what that means.
MR. WEITZMAN: Why don't we take a break. We have been going for a while now. Off the record.
THE VIDEOGRAPHER: The time is 3:20 p.m. and we are going off the record.
(Recess was taken from 3:20 to 3:37.)
THE VIDEOGRAPHER: The time is 3:37 p.m. and we are back on the record.

BY MR. WEITZMAN:
Q. Welcome back, Dr. Metz.
During the last break did you have any substantive discussions with SEC?
A. I don't know what -- I had a call with the SEC. I don't know what a substantive discussion is.
Q. During any of your calls today with SEC did you discuss the substance of your testimony?
A. No.
Q. Okay. Dr. Metz, I'd like to turn to the January 17, 2013, event study that you conducted. Okay?
A. Yes. Uh-huh.
Q. So you conducted an event study on -- to measure whether there was a statistically significant movement in the price of Rio Tinto's ADRs following the January 17, 2013, announcement by Rio Tinto of an impairment; correct?
A. Correct. The impairment and all the other things, but yes.
Q. Why did you decide to conduct an

event study surrounding that date?
A. It was a natural question to ask whether the market reacted to news of the impairment at that time. Of course it just seemed like a natural thing to do.
Q. And is it fair to say that you were hoping to see a negative abnormal return on that date?

A. No, I didn't have any hope to find one thing or another.
Q. Well, a negative abnormal return would have indicated to you that investors reacted to the news released on January 17, 2013; right?
A. A significant abnormal negative return on that day would have indicated that the balance of their reaction to all of the news was statistically negative, yes.
Q. And in most cases where material news is released, is it fair to say that you can expect to see an abnormal return on the day of the release, statistically significant abnormal return?
MR. BEDNAR: Objection.

A. I'm struggling with that question. I don't know what's material news versus immaterial news, saying how often it happens. I'm just not sure I can address your question. I'm sorry.
Q. Okay. I appreciate that.
Based on the results of your own event study, you found that there was no statistically significant abnormal return after Rio Tinto issued its January 17th news release; right?
A. That's correct, yes.
Q. Is it fair to say that on its own, on its own, your event study does not reveal that the impairment announced on January 17 had any material effect on the stock price of Rio Tinto?
MR. BEDNAR: Objection.
A. Mr. Weitzman, I apologize, can you -- can you repeat the question. I just want to make sure I understand word for word what you are asking.
Q. Is it fair to say that on its own your event study did not reveal that the

impairments announced on January 17, 2013, had any material effect on the stock price of Rio Tinto?
MR. BEDNAR: Objection.
A. Again, I'd rather not bring the word "material" into the discussion, because it's

got legal connotations and I, you know, I'd like to park that word to the side. My event study of January 17th does not find a statistically significant abnormal return that day.
Q. And so that I understand the import of that, given the absence of any statistically significant abnormal return on January 17, 2013, is it fair to say that there is no statistical evidence to suggest that anything beyond usual random variation was affecting Rio Tinto's ADR returns on that date?
A. I -- no, I would be reluctant to draw that conclusion. This is a case -- the January 17th is sort of a -- is a case of confounding news and, again, we have got to -- it's the old saw that there is a reason for it. The absence of evidence isn't evidence of an

absence. My opinion is we don't really learn much of anything from the absence of movement on January 17th. I just -- I don't think it's particularly informative. So would I point to the absence of movement and say aha, there was a significant reaction to the write-down? No. But neither would I point to the absence of movement and say, aha, we have evidence that it wasn't important. I just don't think you can conclude much from January 17.
Q. You reached the conclusion, sir, that -- and I quote here -- "the write-down of the Riversdale asset, by itself, could well have put significant negative pressure on the ADR price." Do you recall that?
A. I recall words of that type, yes.
Q. Do you want to -- we can turn to your report. If you turn to Exhibit 212. Paragraph 86, which is on page 39.
A. Bear with me, please. Paragraph 86 you said?
Q. Correct.
A. Yes.
Q. In the second sentence you write:

"The write-down of the Riversdale asset, by itself, could well have put significant negative pressure on the ADR price." Did I read that correctly?

A. Yes.
Q. You did not write that the write-down of RTCM by itself, in fact, did put significant negative pressure on the ADR price; correct?
A. No, I didn't, and I was careful not to write that.
Q. Right. You used the words "could well have" instead of "did"; correct?
A. That's correct.
Q. And you did that carefully, as you said; right?
A. Correct.
Q. And that's because as an economist, sir, you could not conclude to a reasonable degree of scientific certainty that the impairment put any such negative pressure on Rio Tinto's ADR price; isn't that fair to say?
A. On January 17th?
Q. On January 17th.

A. That's correct. I don't have statistical evidence that the impairment put significant negative pressure on the ADR and I didn't want to represent that I did have any such evidence.
Q. As you said, you had no statistical evidence to suggest that the write-down of the Riversdale asset by itself did put significant negative pressure on the ADR price; correct?
A. I had no statistical evidence, that's correct.
Q. When you say that it could well have put significant negative pressure on the ADR price, how much negative pressure could it have put on the ADR price?
A. I -- I didn't conduct any analysis to put a measure on it.
Q. You can't quantify that; correct?
A. I have not made any attempt to quantify it.
Q. Now, the reason you say could well have put significant negative pressure on the ADR price is because of a handful of articles that you cite discussing the management change

that was announced on January 17, 2013; correct?

MR. BEDNAR: Objection.
A. Well, I don't know if the word "handful" is defined. My review -- and, I'm sorry, my camera seems to be frozen. Bear with me one second. That -- that's all good. Okay. Sorry for the interruption.
My review of the commentary on and shortly after January 17th found analysts who expressed surprise, negative surprise, about the impairment of Riversdale, and others, sometimes the same analyst, but often other analysts who expect -- who expressed positive surprise about the change in leadership.
Q. Sir, do you have any -- do you have any firm evidence, hard data, statistical evidence to support your theory that the write-down of Riversdale asset by itself may have put significant negative pressure on the ADR price?
MR. BEDNAR: Objection.
A. Well, I -- I don't know what sort of evidence, statistical evidence, one would

muster to say it could well have. I am explaining that it could well have. There is reason to think that it was negatively received by some analysts and there is reason to think that the change in CEO leadership was positively received, and really all I am trying to say is since the news on this day is so murky and mixed, the absence of movement is not -- it shouldn't really be interpreted as evidence of an absence of reaction, if you will. It's a mixed bag.
Q. When you say that the news was murky and mixed, you are referring to the confounding news, what you call confounding news in the January 17th announcement; correct?
A. Correct.
Q. And that confounding news, what you call confounding news, is that Tom Albanese was departing as CEO of Rio Tinto and would be replaced by Sam Walsh; is that correct?
A. Yeah, that's part of it, yeah.
Q. Okay. And at that time Sam Walsh was the head of Rio Tinto's iron ore group; correct?

A. That's my understanding, yes.
Q. And you believed that the management change, you concluded that the management change in the January 17th announcement was a positive surprise for the market?
A. Based on my reading of analyst commentary, I found many analysts who were surprised, positively surprised by that announcement.
Q. Okay. Before reaching this conclusion in your opening report, how many analyst reports did you review regarding the management change?
A. I didn't keep count.
Q. How did you decide which analyst reports to review regarding that management change?
A. How did I -- well, my -- we gather analyst reports relating to Rio Tinto, which my team reviews, and in the neighborhood of January 17th, plus or minus a few weeks, I read the analyst reports that they pulled which said -- which -- which talked about those issues.

Q. Did you read the actual analyst reports, all of them, or did you read snippets and summaries compiled by your team?
A. I certainly read many. Did I do a side-by-side to say that I had read every word of every one, possibly I did, but I certainly -- my team did and I read all of their summaries of them and I read many of them in their entirety and possibly I read all of them in their entirety. It's taking me back in time.
Q. So if I understand the process, your team compiled the analyst reports and reviewed them in the first instance; is that correct?
A. That's a typical process, yes.
Q. And then they provide you summaries of those analyst reports; is that right?
A. They provide summaries and send over some that they think are particularly noteworthy and then I may request others in their entirety.
Q. But as you sit here today, you cannot testify under oath that you reviewed all the analyst reports regarding the January 17,

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2013, impairment and management change announcement; correct?

A. I reviewed all of the analyst reports that we collected. Now, I -- immediately right away we know we don't collect all analyst reports. That's just a necessary limitation to what's available. But I reviewed all of the analyst reports that we collected around the January 17th period.

Q. And when you say that you reviewed all the analyst reports, are you confirming that you read every one of those reports word for word?

A. No. I mean, you get to -- you get to the end of an analyst report and you have boilerplate this, that and the other. I'm not gonna read that. You know, no, I'm not gonna say that.

Q. Other than the boilerplate, are you saying that you have reviewed every single January -- every single analyst report surrounding the January 17, 2013, announcement in advance of your opening report?

A. Yes, as I use the word "reviewed,"

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yes.

Q. And how do you use the word "reviewed"?

A. Having an understanding of the document and its relevant content to the issues in this case. Some of these documents may have a section on something else and I would not have necessarily read the section on something else.

Q. And do you -- do you gain that understanding either --

THE COURT REPORTER: I'm sorry, sir. I'm sorry. You are cutting out. I'm sorry, sir. You cut out for that question.

Q. Do you gain understanding either reviewing the analyst report itself or the summary --

THE COURT REPORTER: I'm sorry, sir. You are really cutting out on that question.

Q. Is it fair to say, Dr. Metz, you gained that understanding of the analyst report

by reviewing the analyst report itself or by reviewing a summary that your team produces, am

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I understanding your process correctly?
A. I review summaries and I review, read certainly excerpts, and in many cases I read the source document. In some cases I read the source document in nearly its entirety. In other cases I read the elements of the source document which are -- which address the issues that are pertinent to January 17th.
Q. By January 2013 do you recall how long Tom Albanese had been serving as CEO of Rio Tinto?
A. Again, you are testing -- you are testing my memory. My recollection is five years, seven years. But, you know, I'm sure it's -- it's contained in some of these reports and we could go look, but I would have thought it was something on that order. I may be wrong.
Q. Do you know what the average tenure of CEOs among FTSE, F-T-S-E, 100 companies was at the time?
A. No, I have never -- I haven't researched that question.
Q. Do you know what the average tenure

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of CEOs was at that time among the world's largest mining companies?
A. I haven't researched that question either.
Q. Are you aware that at the time of his departure, Mr. Albanese had served longer as CEO of Rio Tinto than most other CEOs had served in peer mining companies?
MR. BEDNAR: Objection.
A. I mean, I -- I couldn't begin to agree or disagree with that question, which peer mining companies, over what period of time. I just can't engage on that question.
Q. Are you aware that these very questions were discussed in analyst reports discussing --
MR. WEITZMAN: I'm sorry. Is there -- is there someone on the line saying "hello"?
THE WITNESS: I hear you. You are

cutting out a little bit.
MR. BEDNAR: I hear somebody else as well.
MR. WEITZMAN: Okay. Is the

videographer and the court reporter, are they still on the line?
THE COURT REPORTER: Court reporter is here.
THE VIDEOGRAPHER: Yes. Yes. Do you want to go off or --
MR. WEITZMAN: No, no, no. Let's just proceed.
THE VIDEOGRAPHER: Okay.
Q. Sir, are you aware -- Dr. Metz, are you aware that the very questions I just asked regarding the average tenure of CEOs in mining companies was discussed in the analyst reports surrounding the January 17, 2013, announcement?
A. I'm well aware that some analyst reports commented on recent tenure of some mining company. You asked a very particular question, which I wasn't prepared to answer. But yes, some analyst reports talked about tenure of some CEOs in some company.
(Defendant's Exhibit 277, RBC Capital Markets, Rio Tinto PLC Change of Guard, January 17, 2013, marked for identification.)

Q. Okay. Well, why don't we look at Exhibit 277. This is an equity analyst report dated January 17, 2013, by RBC Capital Markets.
Do you know whether you reviewed this document before your opening report?
A. Analog paper binders are sometimes uncooperative. I have 277 in front of me. Did I -- did I cite to this report in my document?
Q. Did you review it in advance of your opening report?
A. Whether I literally -- I mean, again, you are testing my memory. Whether I literally reviewed literally this analyst report, I don't know. If I cited to it, obviously I did and I very well may have.
Q. Are you aware that --
A. I don't have a -- I don't have a perfect memory of when I reviewed what

document.
Q. Sir, are you aware that this analyst report is not listed in your Appendix A attached to your opening report?
A. No. Again, I don't have Appendix A committed to memory.

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Q. Do you want to look at Appendix A?
A. In an effort to memorize it?
Q. No. To confirm my statement that this analyst report is not listed in your Appendix A.
A. I -- I would very much like to accept your representation that it's not listed in Appendix A. I'm not disputing it.
Q. If you turn to the bottom, Investment Conclusion, and would you read the first sentence under Investment Conclusion.
A. Just a moment.
Q. Sorry. Can you read that into the record.
A. Yes. "A change of CEO comes slightly earlier than we had expected but changes at Rio, Anglo and BHP are largely expected by the market in the coming year, with Anglo having already replaced Cynthia Carroll with Mark Cutifani." I hope I pronounced that correctly.
Q. By the way, Dr. Metz, I stand corrected, this is one of the analyst reports that you do identify in Appendix A.

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A. Well, I thank you for clarifying that.
Q. Okay. Do you recall reviewing this analyst report before reaching your conclusions?
A. I'm confident that if I cited it, I certainly reviewed it.
Q. Is it fair to say that this analyst believed that the market expected management changes at several major miners that were peers of Rio Tinto?
A. I would agree that's a fair characterization of this report, yes.
Q. Okay. Is there -- withdrawn.
Are you aware that your report, your opening report makes no mention of the

significant turnover among major mining companies in or about the January 2013 time frame?
A. I'm aware that I did not discuss that issue. It didn't seem germane.
Q. What is the reason why you did not discuss that issue, in light of the fact that you concluded there was a positive surprise

resulting from the management change?
A. The fact that other CEOs are leaving doesn't seem germane to the question here. This was certainly not presented and I saw no analyst who interpreted the departure of Mr. Albanese at this time as a run-of-the-mill retirement more or less on schedule. I don't see anybody who characterized it that way. The statement itself I think, in my opinion, a fair reading of it would suggest that poor performance, poor acquisition performance precipitated the departure, and as far as I can recall, every analyst I read, at least virtually every analyst I read certainly interpreted it as a negative thing in the sense of that Mr. Albanese was being let go because of problems with -- with the Alcan and Riversdale acquisitions, but that other companies were turning over their CEOs for other reasons, that didn't seem relevant.
Q. Okay. I want to understand what you just said. You said that every analyst report you read interpreted Mr. Albanese's departure as a negative thing. Is that your testimony?

MR. BEDNAR: Objection.
A. No, I -- I want to be clear. I -- virtually every analyst report I read that comments on the turnover, they viewed the turnover generally as positive, certainly many or most of them did, many of them did. The entire event of replacing Mr. Albanese with Mr. Walsh, that was construed generally in a positive way, and I cite to many examples of that in my various reports. What I am saying is those who commented on it, I didn't -- I don't recall seeing anybody say, 'well, Mr. Albanese is stepping down because, you know, it's time for him to step down, it's

retirement time' and all that. Most everybody seemed to associate the write-downs with the stepping down of Mr. Albanese. At least many of them did.
(Defendant's Exhibit 278, J.P.Morgan Cazenove, European Metals & Mining, 13 December 2012, marked for identification.)
Q. Let me ask you to turn to Defendant's Exhibit 278. This is a JP Morgan analyst report dated December 13, 2012, and if

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you can turn to page 28 of the document, and if you -- if you can read to yourself the section titled 4 at the bottom, over to the next page, Will a New Generation of Leaders Herald Strategy Shifts.
A. Uh-huh.
Q. Have you read this before, this document?
A. I have reviewed this document before today, yes.
Q. Okay. Did you review it before your opening report?
A. I don't remember the first time I reviewed this document.
Q. Based on your review of this document, is it fair to say that the JP Morgan analyst in this document was predicting a wave of new leaders, new CEOs at the major mining companies, including Rio Tinto, in the coming year --
MR. BEDNAR: Objection.
Q. -- after December 2012?
MR. BEDNAR: Objection.
A. I'm sorry, Mr. Weitzman. Would you

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mind repeating your question.
Q. Do you agree with me, sir, that this analyst was predicting CEO transition at the major mining companies as of December 2012?
MR. BEDNAR: Objection.
A. Predicting it? Let me just read it out loud. "In the last few months we have seen at least the beginnings of CEO transitions at three of the five major diversifieds, with only RIO not having begun a formal process. With the incumbents having been in their roles for 5 to 6 years, this process marks the first -- I

don't know what process they mean -- marks the first wholesale change in top leadership since prior to the financial crisis and in our view offers a compelling chance for companies to wipe the slate clean in terms of legacy projects and allow boards to reassess broader strategy.
My reading of that paragraph, I don't see a prediction that Mr. Albanese is about to step down from Rio. Is that what you --
Q. That wasn't my question. My

question was this analyst was predicting, quote unquote, wholesale change in top leadership at mining -- at the major mining companies; correct?
A. I -- I'm confused by your word "prediction." He is documenting that several companies have changed leaderships and this represents a wholesale change. I'm not -- I'm reading this. I am just not seeing the prediction of future events. Sorry.
Q. If we can turn to Exhibit 212.
A. Just remember, it's a little slower for me than other people. 212.
Q. If you can turn to page 38 of your expert report.
A. Yes, I'm on page 38.
Q. In the second dash bullet point on page 38 that starts with "Sam Walsh is known to the market."
A. Yes.
Q. You quote from an HSBC analyst report dated January 17, 2013; correct?
A. Yes.
Q. And this analyst report was relevant

to your analysis of the -- of how the market reacted to the news of the impairment and the management change; correct?
A. It was part of my review of the contemporaneous commentary, yes.
Q. Did you personally review the HSBC analyst report?
A. Yes.
Q. Did you choose which portions of the HSBC report to quote in your -- in your expert

report?
A. Not in all cases. I discussed with my team the substance and general messages of the report and often asked them to provide sort of a first pass of here we think are the representative quotes that are most -- most relevant. Very often I would accept their recommendation. Probably in most cases I accepted their recommendation.
Q. Let's go to the HSBC analyst report you quote on page 38 of your expert report, and if you can find it, it's Exhibit 279.
(Defendant's Exhibit 279, HSBC Global Research Flashnote, 17 January 2013,

marked for identification.)
THE WITNESS: My binder just popped open and everything spilled on the floor.
MR. WEITZMAN: Do you want to go off the record?
THE WITNESS: I hope you don't have too many more of these.
THE VIDEOGRAPHER: Off the record?
THE WITNESS: I'm sorry. It just opened and a whole lot of documents fell, so I think I have -- oh, no, darn it. I was in the middle of getting 279.
MR. WEITZMAN: We can -- it's on the computer screen, if you want to look at it there.
THE WITNESS: No, it's not -- it's not -- it's not too bad. Most of these -- most of these fell out in order. Just bear with me one second, please.
MR. WEITZMAN: Why don't we go off the record.
THE VIDEOGRAPHER: Okay. The time is 4:14 p.m. and we are going off the record.

(Recess was taken from 4:14 to 4:20.)
THE VIDEOGRAPHER: The time is 4:20 p.m. and we are back on the record.
BY MR. WEITZMAN:
Q. So before the break, Dr. Metz, we were discussing that you quoted from a section of the HSBC report that's in front of you as

Exhibit 279 in your opening report. Correct?
A. Correct.
Q. And the section you quoted was on page 2 under "a new CEO" starting with "Sam Walsh is known to the market." Do you see that?
A. I do see that.
Q. Now, if you go down to the section -- I think it's four sentences in, it states, quote: "We do not think the market will be uncomfortable with this change and Tom Albanese has been at the helm for over five years, longer than the average tenure of a FTSE100 CEO." Did I read that correctly?
A. Yes, I think so.
Q. Are you aware, sir, that you omitted

that sentence from your quote from the HSBC analyst report we are looking at?
MR. BEDNAR: Objection.
A. I mean, I -- if we go back to the report, I don't think that sentence is in the quote that I present.
Q. Okay. And is there -- is there a reason why you did not -- you omitted this one sentence regarding the length of Tom Albanese's tenure compared to other -- other CEOs at FTSE 100 companies?
A. Well, as I -- as I explained, I just don't see how that's relevant to the issues of January 17th. I mean, I'm sure that Mr. Albanese was the CEO longer than some people and less long than others, but I -- I didn't see it as relevant.
Q. Do you think the market's expectations as to whether Mr. Albanese would be transitioning at or near the time of January 2013 is relevant to your analysis?
MR. BEDNAR: Objection.
A. It doesn't -- I am sitting here trying to think whether that's particularly

relevant. It doesn't strike me as particularly relevant. The question is when he was -- when he did depart for the reasons he departed and when his successor was named and received, you know, what was the impact of that sort of joint event. That's -- that's the question.

Q. Sir, isn't the question whether the market -- there was a market surprise, isn't that part of the question?
A. Part of the question? Part of -- part of what question?
Q. Sir, the question you asked and the basis for your conclusions about January 17, 2013, is that the market was positively surprised by the -- by the departure of Tom Albanese and the appointment of Sam Walsh, isn't that your testimony?
A. My conclusion, again, on January 17th is that we don't learn much of anything for various reasons. One of those reasons is that many analysts expect -- expressed surprise and a positive reception to the news of CEO leadership change.
Q. Sir, I'm not trying to be difficult,

but in your opening report don't you characterize Tom Albanese's departure as a positive surprise?
A. I get the quote, but I -- but I do -- I agree with that, I do believe that on balance market analysts that I reviewed were positively surprised by this news, by this change.
Q. And so do you think it's relevant to that analysis to see whether the market expected CEO turnover at Rio Tinto based on Mr. Albanese's average length -- based on the fact that Mr. Albanese had already served longer than the average length of CEO tenure at comparable companies, is that relevant to your analysis?
MR. BEDNAR: Objection. Objection.
A. Not nec- -- there is so much in that question. You know, I --
Q. Not really, sir. It's a very direct question.
MR. BEDNAR: Objection. Argumentative.
A. Respectfully, I'm not sure how

straightforward that is. We are dealing with -- with lots of things that happened on January 17th. Now, you know, is it relevant if -- if we could establish, if it even could

be established, that, quote unquote, the market expected that Mr. Albanese might depart at some point even in 2013 is that relevant to understanding analyst reaction to the news that actually happened on January 17th strikes me as rather tangential. What would -- what would matter, you know, if most -- if I can just finish. If most -- if the market, again, we have to define what that is, but if the market expected Mr. Albanese to nicely retire at some point in 2013 because his time was up and it was time to retire and he would be replaced by his hand-picked successor to continue steering the ship exactly the way he had steered it, maybe that was the market expectation, I don't know, but what -- but that's not what happened, and I think that what happened and the timing on which it happened I cite to many analysts who used the word surprise and positive and good for shareholders. That's -- I'm not

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trying to take it any further than that.

Q. Okay. So it's your testimony that the reason -- the sentence that you quoted was because --

THE COURT REPORTER: I'm sorry. I'm sorry, sir, you are cutting out. Could you repeat.

MR. WEITZMAN: Yes.

Q. I want to understand your testimony, Dr. Metz. It's your testimony that you did not include the HSBC report that directly follows the sentences that you did include was because you thought it was not relevant?

A. Correct.

Q. Is that correct?

A. I think that's what I said, yes.

Q. Okay. If we look at the top of page 2 of the HSBC report, do you see the paragraph titled "Mozambique write-down"?

A. Yes, I see that.

Q. Okay. The top of that -- that paragraph states, and I will read it in full: Rio will also write down the value of its Mozambique coal assets by 3 billion U.S.

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dollars. Given that RIO bought these assets for 5 billion U.S. dollars in a hostile

acquisition of Riversdale Mining in 2011, this is a more recent and arguably embarrassing correction. The reason highlighted for the write-down was a lack of formal approvals for the movement of coal along the Zambezi river by barge and a revision to estimates of recoverable coking coal volumes. We have never incorporated Mozambique assets into our earnings estimates, as we have been unaware (sic) of the development path.

Do you believe it's relevant to your analysis that this analyst never incorporated any Mozambique assets into their model?

A. No.

Q. Do you think it's relevant whether analysts incorporated Mozambique into their models at all?

A. I hadn't thought about it in those terms. What's relevant to my analysis is -- again, the only conclusion I am trying to draw, we all accept, I think, the fact that there is no statistically significant movement on

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January 17th. The only point I am trying to make is that we don't learn very much from that. So with that opinion --

Q. Sir, can I pause you there.

A. I'm sorry?

Q. Can I pause you right there, because I just want to understand something about that.

You have also hypothesized that the impairment could well have put negative pressure on the ADR price; correct? As the other conclusion you are asking the court to draw.

MR. BEDNAR: Objection.

A. I mean, my conclusions are stated in the report. I am saying there is no movement on that day and I am trying to explain why that absence of movement is not particularly informative of any strong conclusions. My concern is that somebody would look at that absence of movement and conclude, well, therefore, the write-down doesn't matter, and I don't think that that's a fair inference to draw from the evidence. That's what I am trying to explain.

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Q. Sir, is it relevant to your conclusion as to whether there could well have been negative pressure on the ADR price as a result of the impairment that equity analysts were not incorporating Mozambique assets into their revenue models or earnings estimates long before January 2013, is that relevant to you?
MR. BEDNAR: Objection. Objection.
A. What -- what's relevant is that some were, some put value on Riversdale or RTCM, as it was called at the time. Some expressed negative surprise to the announcement of the write-down. I don't claim, nor do I require, nor do I expect that all analysts are uniformly of that opinion, and demonstrably not all analysts are uniformly of that opinion.
Q. Sir, you are asking this court to trust you as an expert witness and rely on your expert opinions; correct?
A. Yes.
Q. Okay. You agree with me, sir, do you not, that for the court to trust you, you can't be engaging in cherry-picking of opinions from analysts, do you agree with that?

MR. BEDNAR: Objection. Argumentative. Mischaracterizes his testimony and his report.
Q. Sir, do you agree you shouldn't be cherry-picking analyst reports to present only one side that's favorable to your conclusions?
A. I think by definition of the words "cherry picking" it sounds like bad practice.
Q. Can I take that as a yes, that you shouldn't be engaged in selectively quoting and omitting the portions that are unfavorable to your conclusions when presenting your expert opinion to the court?
MR. BEDNAR: Objection. This is argumentative. You have asked him to agree with your interpretation of one sentence of this report that you have cherry-picked from this report. He didn't give you the answer that you wanted. You are now arguing with him and you are asking the same question over and over again, and I will make the same objection every time you do it.
MR. WEITZMAN: And you are welcome

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to do so.
Q. Dr. Metz, would you agree with me that you should not be engaging in that type of conduct when presenting your opinion --
A. What type of conduct?
MR. BEDNAR: Avi, you cut out at the tail end of that.
Q. That you should not be cherry-picking analyst reports to omit the portions that are contrary to your conclusions?
MR. BEDNAR: And I object if your implication is that he has done that here.
A. If -- if an expert is trying to make the case that there were analysts who thought X and then proceeds to present evidence of analysts who thought X, that would seem to me to be appropriate. If an expert -- let me finish. If -- if an expert says -- let me finish. If an expert says every analyst on earth thought X and was aware of an analyst who thought not X and tried to conceal that, that seems like very bad practice, but none of this -- I mean, I'm sorry, with respect, none of this applies to me or my report or anything

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that I did.
Q. Could we turn to your rebuttal report, Exhibit 225, and if you would turn to page 56. I am going to draw your attention to paragraph 124 in particular.
A. Okay. I'm sorry. You are just moving a little faster than I am. What's the exhibit number, please?
Q. It's Exhibit 225. It's your rebuttal report. It's page 56.
A. 225. Page 56. Okay.
Q. I am going to draw your attention to paragraph 124 at the top.
A. Uh-huh.
Q. Paragraph 124 says: "HSBC agreed, stating that the write-down was 'embarrassing' and 'unusual'," and then you quote from the paragraph I just read into the record from the HSBC report. Do you see that?
A. Yes.
Q. And do you see that you have an ellipses five lines down, three dots?

A. Uh-huh.
Q. And the very sentence you omitted

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from the HSBC report and did not include in your expert report was the sentence that I had read into the record, quote, "we have never incorporated Mozambique assets into our earnings estimates, as we have been unsure of the development path."
A. Uh-huh.
Q. Did you make the decision to omit that sentence or did a member of your team?
A. I am responsible for the quote as it's presented here.
Q. Do you agree with me that that sentence in the HSBC report which you proffered to the court as helpful to your conclusion, that that one sentence that you omitted was unhelpful to -- unsupportive of your conclusion?
A. No.
MR. BEDNAR: Objection.
A. No. The point of this quote is that the write-down is whatever the words were, embarrassing and unusual, which are things to which the market might react. HSBC didn't put Rio into its valuation not because it doesn't

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have value, but because it was unsure of how to model it. Now, that's HSBC's problem and issue and they discuss it. This doesn't mean that if you had asked HSBC 'do you think there is value here' that they would have said 'no, we are not modeling it because we think it's worthless.' That's not what that sentence means. They are saying 'we didn't incorporate it into our valuation because we were unsure of the development path.' Other people could have incorporated -- I remember one analyst, I don't know which one, who says 'because we are not getting great data, we are just gonna carry it at half the purchase price.' That's how some people chose to deal with the relative dearth of information and specifics coming from Rio, but to try and interpret that sentence to mean 'we at HSBC think this thing has no value and so did everybody else,' it's just not what the sentence says.

Q. Sir, so just so I understand, if you were rewriting this report today, you would still omit that one sentence from the HSBC analyst report, is that your testimony, no

regrets?
MR. BEDNAR: Objection.
A. I -- I have no regrets about how I presented this information.
Q. Okay.
A. HSBC thought that the write-down was embarrassing and unusual. That's the only point that I'm -- I'm getting out of this.
Q. You rely on a number of academic studies to support your conclusion that the management change can be associated with statistically significant abnormal price changes; correct?
A. Correct.
Q. Do you agree with me that when drawing conclusions about real world events from academic study, it's important for you to use studies that evaluate substantially similar circumstances to those real world events you are analyzing?
MR. BEDNAR: Objection.
A. I'm sorry, Mr. Weitzman. Could you repeat that just one more time.
Q. Yes. Would you agree with me that

when drawing conclusions about real world events from academic studies, it's important to use studies that evaluate substantially similar circumstances to those real world events?
A. I mean, there are a lot of kind of loosey words --
MR. BEDNAR: Objection.
A. -- like substantially similar and -- I think it's important to use relevant academic studies. Maybe that's acceptable formulation.
Q. The closer the circumstances in the studies to the real world events, the more relevant they are; correct?
MR. BEDNAR: Objection.
A. Closer to circumstances -- I -- that seems reasonable to say.
Q. Mr. Albanese's successor as CEO was Sam Walsh; right?

A. Correct.
Q. And he was an insider at Rio Tinto at the time; correct?
A. What's your definition of "insider"?
Q. Well, are you familiar with the commonly used phrase "insider" in the academic

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studies that you cited?
A. If you mean he was an employee of Rio Tinto at the time he became CEO, yes, he was.
Q. One of the studies that you relied on was a study by Furtado and Rozeff. Do you recall that?
A. Yes, I do.
Q. And did you personally review that study?
A. Yes.
Q. Did you personally review it in its entirety?
A. Substantially, yes.
Q. Okay.
A. Acknowledge things (phonetic) that I didn't read, but, I mean, you know, I don't want to get difficult about it.
Q. If you turn to Exhibit 212, which is your opening report, and if you turn to page 34 of the PDF.
A. Is that like page 34 of the report, but paragraph 79? Yeah, okay.
Q. Yes. Paragraph 80. If you look at

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paragraph 80, in the middle of the paragraph you write: "Furtado and Rozeff find an average positive and statistically significant abnormal return of 0.51 percent (at the 5% level)." Did I read that correctly?
A. Yes.
(Defendant's Exhibit 280, article entitled The Wealth Effects of Company Initiated Management Changes, marked for identification.)
Q. Let's turn to the report itself. If you can turn to Exhibit 280. Do you recognize this as the Furtado and Rozeff study that you just cited in your opening expert report?
A. Bear with me a minute. I am trying not to spill all the contents of the binder out

again. Give me a second, please. It's Exhibit 280, is that what you said?
Q. Correct.
MR. BEDNAR: Counsel, while he is turning to that, can I just inquire whether the reporter can hear okay? Some of the people on my team are saying that they are hearing a noise or some feedback on the

line. I wanted to make sure the reporter and the witness can both hear you okay.
THE VIDEOGRAPHER: This is the videographer. I am not hearing any feedback at all.
MR. BEDNAR: Okay. Good. Dr. Metz, can you hear okay?
THE WITNESS: Yes, it sounds clear to me.
THE COURT REPORTER: Reporter is okay.
MR. BEDNAR: Ms. Koch, you are okay?
THE COURT REPORTER: Reporter is good.
MR. BEDNAR: Okay. Thanks. Thanks.
Q. Do you have Exhibit 280 in front of you?
A. I do.
Q. Okay. And if you can turn to page 153 of the document, which is page 7 on the PDF, and you will see at the top Table 4.
A. Uh-huh.
Q. And the abnormal return of 0.51 percent is listed at the top of Table 4

under Firm Size, Large; correct?
A. Uh-huh.
THE COURT REPORTER: Sir, if you can answer verbally, please.
THE WITNESS: Oh, my apologies.
A. Yes, I see that.
Q. Now, it states at the top of Table 4 that the table reflects the, quote unquote: Two-day average announcement period abnormal returns in percent for appointments of internal and external candidates arranged by company size for 323 appointments, 1975 to 1982.
Do you see that?
A. I do.

Q. And if you would go back one page -- two pages to page 151 of the document, and in Table 2 they broke down what type of management changes comprised the set of 323 total appointments; correct?
A. Uh-huh.
THE COURT REPORTER: Sir, can I get a verbal answer. I'm sorry. I need a verbal answer.
A. Yes.

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A. Metz

THE COURT REPORTER: Thank you.
A. Yes.
Q. In your opinion, do any of these listed dispositions match the announcement of Mr. Albanese's departure with the concurrent appointment of Sam Walsh?
A. I'd have to -- I'd have to spend more time with the document. I don't really remember what no mention of predecessor -- appointment to a vacant post, how they define that, if it has to be vacant for how long. I agree that none of these says, you know, replacing someone terminated on the same day.
Q. You recognize that this table concerns 323 appointments, i.e., the appointment, let's say, of Sam Walsh as CEO; right?
MR. BEDNAR: Objection.
A. I mean, it's listed as described as disposition of the predecessor executive in the sample of 323 appointments. So in 7 cases --
Q. None of these --
A. -- they don't discuss the predecessor so --

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A. Metz

THE COURT REPORTER: I'm sorry?
A. Sorry. So seven cases they don't discuss the predecessor, so I don't immediately know what's happening in those seven cases. Predecessor to retire, appointment to a vacant spot. Yeah. I'm sorry, what was your question?
Q. In your opinion, do any of these categories in Table 2 correspond to what happened on January 17, 2013, yes or no, if you can answer?
A. In my opinion, which isn't the only

opinion that's relevant, in my opinion this table doesn't contain how I would categorize the turnover in January 17. I might point out, if I'm allowed to continue, that, for example, you might read the HSBC document we were just talking about to be essentially a retirement. I mean, I'm not saying that you would. I don't mean to put words in your mouth. But it was -- if the document says stepping down by mutual consent, Sam Walsh is a safe pair of hands. So the reason I incorporated this study among the many other studies that we talk about is even

to those people, and I think it's a minority, but even to those people who might have said this is a run-of-the-mill, time to go, Mr. Albanese is stepping down, they are just replacing him with Walsh, ho-hum, even to that group of people there is reason to think they might have reacted positively. I wouldn't characterize January 17th that way. My reading of the commentary is that most commentators who discussed the issue wouldn't characterize it that way. Some might.

Q. Furtado and Rozeff, their study, in fact, shows that not all announcements of departures with successors result in statistically significant positive results; correct?

A. Oh, I'm tempted to say of course.

Q. Okay. If you turn to page 156 of the study, in the last sentence of the first full paragraph, and I will read it into the record, Furtado and Rozeff state, quote unquote: "Dismissals that are not designated as being 'under pressure' but rather are associated with internal replacements show no

significant wealth effects." Did I read that correctly?

A. Sorry. Where are you?

Q. The first full paragraph under Table 6 on page 156. It states, quote unquote, in the last sentence: "Similarly, dismissals that are not designated as being 'under pressure' but rather are associated with internal replacements show no significant wealth effects." Correct?

A. It says that, yes.
Q. Did I read that correctly?
A. Uh-huh.
Q. Okay. And by no significant wealth effects, does that mean that there are no statistically significant positive abnormal returns associated with such dismissals?
A. I mean, honestly, I -- I would need to spend more time with the document to know if that's how they define wealth effects. It's possible that that's what they mean, but, you know, maybe they have something else in mind. I don't remember.
Q. Sir, one of the reasons that you

concluded that the replacement of Tom Albanese with Sam Walsh was a positive surprise is that it was designed to break with the strategy policies of Tom Albanese; is that a fair characterization of your report?
A. Very precise. It's not my characterization that it's gonna break strategically. It's my reading of analyst commentary who interpret it that way. I just want to be clear about that distinction.
Q. And the analyst commentary that interpret it that way according to you believed that the appointment of Sam Walsh would change the capital allocation strategy at Rio Tinto; is that fair to say?
A. Capital allocation strategy? I mean, most of -- most of what I recall is related to M&A discipline and cost control and things like that, if you want to call it capital allocation, but capital allocation could mean something else to somebody else.
Q. Are you aware, sir, that in the months prior to January 2013 Tom Albanese and Guy Elliott actually announced that very

strategy shift that you are referring to?
A. Let's be clear. What strategy shift is it that they announced?
(Defendant's Exhibit 176, Rio Tinto Group LSE:RIO Shareholder/Analyst Call, Thursday, November 29, 2012, Bates stamped RT_SEC_00294847 through RT_SEC_00294877, marked for identification.)

Q. Well, let's go to the documents. Can you turn to Defendant's Exhibit 176. Defendant's Exhibit 176 is a transcript from a November 29, 2012, shareholder/analyst call of Rio Tinto.
Before your report, your opening or rebuttal reports, did you review a copy of this November 29, 2012, analyst call?
A. I -- I don't remember when I reviewed it.
Q. Are you aware, sir, that this analyst call is not listed among the documents you reviewed in your appendices?
A. Are we sure this time? I mean, I'm happy to accept --
Q. Fair question.

A. -- if you are correct that it's not listed in my Appendices A. And I am not trying to be cute.
Q. If we can turn to page -- it's page 4 of the document.
A. Uh-huh.
Q. The one at the top that says Presentation.
A. Uh-huh.
Q. And I'll read into the record a quote from Tom Albanese on this call. In the last full paragraph, the bottom six lines, quote: "We, and the rest of the mining sector, have seen unacceptable levels of cost increases over the past 5 years, particularly here in Australia and all of our management teams do need to focus on aggressive cost compression to roll back these unsustainable cost pressures. So we're now targeting cumulative cash cost savings of over $5 billion over the next 2 years. Our focus on capital efficiency is a constant process. New projects are coming under even greater scrutiny and I would not expect any major capital approvals in the

near-term."
Do you see that?
A. I do.
Q. And if I can -- did I quote -- did I read that correctly?
A. I believe so.

Q. On top of page 5, six lines down,
Tom Albanese continued, quote: So we will be disciplined in our investment program, given the market volatility. Our aim is to keep an A credit rating and the desire for cash returns to shareholders.
Did I read that correctly?
A. Uh-huh.
THE COURT REPORTER: I'm sorry, sir. Could you answer verbally.
THE WITNESS: I'm sorry.
A. Yes, I believe you read it correctly.
Q. This was a significant strategic announcement on November 29, 2012, wasn't it?
MR. BEDNAR: Objection.
A. Define "significant."
Q. Was this -- did you conduct any

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analysis to see whether analysts deemed these statements important in their analysis of Rio Tinto?
A. I did not conduct an analysis of market or analyst response to these statements, no.
(Defendant's Exhibit 286, Deutsche Bank Markets Research, Capital Allocation Held to Account, 17 January 2013, marked for identification.)
Q. Why don't we turn to -- turn to Exhibit 286. This is a report from Deutsche Bank dated January 17, 2013. In the first paragraph, last sentence, it states, quote: "Sam Walsh (Iron Ore CEO) has been announced as CEO successor. Somewhat long-awaited, this heralds the potential for a further improvement in capital allocation. We reiterate our Buy rec." Did I read that correctly?
A. I believe so.
Q. Okay. And does the fact that Deutsche Bank believed that the announcement of Sam Walsh as successor CEO was long awaited, does that mean to you that Deutsche Bank

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expected a --
(Phone conference interruption.)
THE COURT REPORTER: Sir, I'm sorry. You were in the middle of a question.

MR. WEITZMAN: Let me -- let me repeat the question.
Q. Does the fact, sir, that Deutsche Bank analysts described Sam Walsh's announcement as successor CEO as long-awaited, does that inform your conclusion as to whether there was a positive surprise with respect to the announcement on January 17, 2013, that Mr. Albanese was stepping down and Sam Walsh was replacing him?
A. I think so. Again, long awaited could mean a lot of things. Right? A long-awaited return of something you value. It doesn't mean you were predicting it. It means you have been hoping for it. And, of course, we can read -- sorry. We could read further in the document, to the extent my eyes allow me: "Today's rapid Board response to a second misallocation of capital (Riversdale after Alcan) is the first step in this change in our

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A. Metz

view with very clear message that capital spending will be subject to increased scrutiny." So my reading of this document is they welcomed this change in leadership.
Q. Did the fact that the Deutsche Bank analysts stated that this was long awaited suggest to you that they were expecting an announcement of a successor to Tom Albanese?
MR. BEDNAR: Objection. You are misquoting. It says somewhat long awaited.
MR. WEITZMAN: You can answer.
A. I wouldn't use the words "long awaited" necessarily to describe something that I was expecting. I would use the more along the lines of something I was hoping for.
Q. And does the fact that the Deutsche Bank analyst stated that this heralds the potential for further improvement in capital allocation suggest to you that there had already been an improvement in capital allocation announced by Tom Albanese?
A. I would accept that that's usually what is meant by the word "further" in that context.

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A. Metz

Q. Do you agree with me that the November 29th announcement at the analyst call

regarding improvement in capital allocation was a strategic shift by Tom Albanese along the lines of what equity analysts were commenting on in January of 2013?

MR. BEDNAR: Objection.

A. Yeah, I mean, I -- I heard comments in the November call about cost cutting. I'd have to go -- what costs, operating costs. I -- you know, again, in my reports, I will just point you to my reports, I cite report after report after report which I think are very clear in their language that they think Sam Walsh is going to do things differently and better and in favor of shareholders. I'm not saying all analysts said that. I never said all analysts said that. But many do and I provide some examples.

(Defendant's Exhibit 287, Investec, New CEO, Same Strategy, But Catalyst For Further Changes, 18 January 2013, marked for identification.)

Q. If you can turn to Exhibit 287.

This is an Investec analyst report dated January 18, 2013, regarding Rio Tinto. The title of the analyst report is New CEO, Same Strategy, But Catalyst For Further Changes. Do you see that?

A. I do see that title.

Q. Does the fact that this analyst stated same strategy suggest to you that analysts were not expecting a shift in strategy from Sam Elliott, an internal candidate to replace Tom Albanese?

MR. BEDNAR: Objection.

A. No, and I -- I think, if memory serves, if you check Dr. Hubbard's report, you will find that he doesn't agree with that characterization either. I think he categorizes this report as, quote unquote, positive on the CEO change. My memory might be wrong on that point, but that's sort of what I recall.

(Defendant's Exhibit 288, Macquarie Equities Research, Rio Tinto Acquisition Accountability, 18 January 2013, marked for identification.)

Q. Why don't we go to Exhibit 288.
This is an analyst report from Macquarie dated January -- January 18, 2013; correct?
A. Uh-huh.
Q. The date is on the bottom of the page. And if you can turn to the second page. And in the third bullet point titled Management Changes it states, and I quote: "Although the management changes appear to have been well received, their scale and hurried nature could pose challenges in the months ahead. That said, we expect new CEO Sam Walsh to focus on continued cost cutting, strict capital management and the delivery of existing growth plans. However we expect few major strategic moves under Walsh, despite the opportunities that such volatile commodity prices might throw up." Do you see that?
A. I do.
Q. Is it fair to say that Macquarie was yet another bank whose research analyst expected that Sam Walsh would not -- would maintain the status quo as CEO?
MR. BEDNAR: Objection.

A. I don't see status quo, and I think to me an important point is the management change appears to have been well received. That's -- that's what we are -- that's what we are questioning, whether this management change was well received. They seem to agree that it was.
(Defendant's Exhibit 289, Nomura Equity Research, Enter Sam Walsh, January 17, 2013, marked for identification.)
Q. Can we turn to Exhibit 289. This is an analyst report from Nomura dated January 17, 2013, regarding Rio Tinto; correct?
A. Yes, I see that.
Q. And if you read the second paragraph titled Significant Management Change, do you see that?
A. Uh-huh.
MR. BEDNAR: Counsel, you are not showing any of these exhibits? Are you going to put any of these exhibits on the screen?
MR. WEITZMAN: I think we are having technical difficulties. I think my team is

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trying to do that. I apologize, Tom.

Q. In the paragraph it quotes: "Sam Walsh (the new CEO with immediate effect) is well known to the market, has been with the Group since 1991, has been in charge of Rio's iron ore business since 2004, and has been on the Board since 2009. He is seen as a 'straight shooter,' but the market will likely adopt a 'wait and see' approach to his leadership of this large, and diverse business." Do you see that?

A. I do see that.

Q. Fair to say that Nomura thought that the market will adopt a wait-and-see approach to Sam Walsh, Sam Walsh's appointment?

A. It's -- I think it's fair to say that that's their prediction. While they personally seem to think that it's a positive change, they seem to anticipate the market will take a wait-and-see approach. I would point out different from saying the market should take a wait-and-see approach.

Q. If you look at the next paragraph titled Increased Potential For Shareholder

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Returns, question mark.

A. Uh-huh.

Q. Nomura wrote, quote: "We do not expect to see any major change in strategy from the group with the new CEO appointment." Do you see that?

A. I do see that.

Q. Again, this analyst thought that Sam Walsh would be more of the same with respect to the strategy of Rio Tinto; is that fair to say?

A. I mean, if we --

MR. BEDNAR: Objection.

A. -- keep reading: We would expect recent events to bring that figure down even further, we would be surprised to see Rio involved in any M&A activity in the near term. You know --

Q. Didn't Tom Albanese and Guy Elliott announce that they don't expect any major M&A activity in the near term back in November 2012?

MR. BEDNAR: Objection.

A. I mean, I'd have to go back whether they literally said any. They may have.
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MR. WEITZMAN: Okay. Can we go off the record and take a break.
THE VIDEOGRAPHER: The time is 5:08 p.m. and we are going off the record.
(Recess was taken from 5:08 to 5:30.)
THE VIDEOGRAPHER: The time is 5:30 p.m. and we are back on the record.
BY MR. WEITZMAN:
Q. Dr. Metz, you are familiar with the term "street earnings"; is that correct?
A. Yes, I am.
Q. And street earnings are the non-GAAP earnings numbers that take into account and exclude, for example, one-time impairments; is that correct?
A. Among other variations and changes and settings, yes.
Q. If an investor is to analyze Rio Tinto's street earnings on January 17, 2013, the impairment of RTCM wouldn't have affected Rio Tinto's underlying earnings; correct?
A. Let me restate your question slightly. Would --
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Q. Okay.
A. If your question is would certain, quote unquote, street earnings have smoothed out or ignored the impairment of RTCM, most likely yes, certain street earnings would have done that.
Q. Okay. Thank you.
Credit ratings agencies don't take into account non-recurring charges such as impairments when analyzing a company's rating; correct?
MR. BEDNAR: Objection.
A. Oh, no, no, I wouldn't agree with that.
Q. Okay. You worked at Moody's for fifteen years; correct?
A. I did.
Q. Moody's credit rating methodology specifically excludes non-recurring charges; isn't that correct?

THE COURT REPORTER: Sir, I'm sorry. You cut out. Sir, I need a repeat of the question, please. You cut out.
Q. Moody's credit rating methodology

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specifically excludes non-recurring charges; isn't that correct?
A. No, that's not.
MR. BEDNAR: Objection.
Q. Okay. Can we go to Exhibit 230.
THE VIDEOGRAPHER: Excuse me. This is the videographer. I lost the phone about a minute ago and I had no way to communicate to you. I just want to let you know that. Kristin, were you still getting it?
THE COURT REPORTER: Yes.
THE VIDEOGRAPHER: I'm sorry, sir. We lost about a minute on the audio. Just letting you know that, sir.
MR. WEITZMAN: Okay. I'm sorry. Let me --
THE COURT REPORTER: I'm sorry. You are breaking up.
MR. WEITZMAN: Yeah, why don't we go back and let me ask a couple questions so that they are captured in the audio.
THE WITNESS: Okay.
THE COURT REPORTER: Sure.

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MR. WEITZMAN: Sorry to redo this, Dr. Metz.
THE WITNESS: Sure.
Q. Dr. Metz, just to reiterate your testimony a moment ago -- exclude non-recurring items like one-time impairment --
THE COURT REPORTER: I'm sorry, sir. You cut out at the very beginning.
THE VIDEOGRAPHER: Is it possible --
MR. WEITZMAN: Let me try --
THE VIDEOGRAPHER: I'm sorry. This is the videographer. Is it possible we have too many phone -- people calling in? Because when I just dialed in, it said there were 24 people dialing in and I don't know if that's the issue or not.
MR. WEITZMAN: I don't think so. I think -- why don't we try again.

THE VIDEOGRAPHER: Okay. Sir, I'm sorry.
Q. Dr. Metz?
A. Yes.
Q. Dr. Metz, street earnings exclude one-time impairments; correct?

A. Among other things, yes.
Q. And is it correct to say that Moody's, your former employer, states in its credit rating methodology that it too excludes non-recurring charges like impairments?
A. Which credit rating methodology?
(Defendant's Exhibit 230, Rating Methodology, Moody's Approach to Global Standard Adjustments in the Analysis of Financial Statements For Non-Financial Corporation - Part I, February 2006, marked for identification.)
Q. Let's turn to Exhibit 230.
A. Uh-huh.
Q. Do you recognize Defendant's Exhibit 230 as a Moody's document?
A. I do.
Q. And if you turn to page 3 of the PDF.
A. Uh-huh.
Q. And at the bottom under Adjustments it states, quote: "In general, Moody's adjusts financial statements to better reflect, for analytical purposes, the underlying economics

of transactions and events and to improve comparability of a company's financial statements with those of its peers. More specifically, we adjust financial statements to," and in the second bullet point states: "Identify and segregate the effects of unusual or non-recurring items. By stripping out these effects, we are better able to perceive the results of ongoing, recurring and sustainable activities. Our standard adjustment 'unusual and non-recurring items' addresses this category." Do you see that?
A. I do see that.
Q. Is it correct to say that Moody's strips out from a company's financial results unusual or non-recurring items?

A. As part of its standard adjustments to ratios, yes.
Q. Okay. And those unusual or non-recurring items would include impairments like the RTCM impairment; correct?
A. Well, that's what I am trying to check. Do you see in the document where it says that it excludes write-downs?

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Q. I am asking you. You worked at Moody's for fifteen years. Are you aware of the methodology?
A. Yeah, I'm aware of the methodology. Typically -- so, I'm sorry, what's -- what's -- the pending question?
Q. Do you know whether one-time impairments like the RTCM impairment would be stripped out of a financial statement as an unusual or non-recurring item by Moody's?
A. The only reason I am hesitating is Moody's typically likes to be a little conservative and so they are more likely to strip out a one-time gain than a one-time loss, but I confess, you know, whether that was true of this methodology or the methodology that may have been in place when it was rating Rio, I don't recall. So I'll accept based on the definition of the words that they may have stripped out a one-time impairment like Riversdale.
Q. Are you aware, sir, that equity analysts exclude non-recurring events like impairments from their analysis of a company's

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financial statement?
A. Again, I'm aware with the term "street earnings" that some equity analysts will do that sometimes in some circumstances, yes.
Q. Are you aware that there is a number of academic articles that have identified a prevalence among equity analysts and investors to strip out non-recurring items like impairment from their analysis of financial statements?
MR. BEDNAR: Objection.
A. Yeah, you have combined now analysts with investors. I --

Q. Let's start -- let's break that up then.
Are you aware, sir of the literature, academic literature, that shows that equity analysts strip out impairments when analyzing financial statements?
A. Again, many do many times.
Q. And are you aware, sir, of the academic literature that shows that investors and the market react based on street earnings,

not GAAP earnings?
A. No, I have never seen a study that says that.
(Defendant's Exhibit 290, article entitled GAAP Versus The Street: An Empirical Assessment of Two Alternative Definitions of Earnings, marked for identification.)
Q. Okay. Can we turn to Exhibit 290.
A. Sorry. It just takes me a little bit of time with the second binder. It's bent. Uh-huh, yes.
Q. Defendant's Exhibit 290 is an article in the Journal of Accounting Research titled GAAP Versus the Street: An Empirical Assessment of Two Alternative Definitions of Earnings, written by Mark Bradshaw and Richard Sloan.
Before your signing any of your expert reports, had you reviewed this article?
A. Yes.
Q. Was that before your opening report or before your rebuttal report?
A. Certainly before my rebuttal report.

Q. Okay. Before your opening report do you recall whether you reviewed this article?
A. I -- I don't have any recollection of having read this article before my opening report.
Q. Let's look at the Abstract. Let me read three sentences in the Abstract in the middle of the page. Quote: "Our results show that over the past 20 years there has been a dramatic increase in the frequency and magnitude of cases where "GAAP" and "Street" earnings differ. Further, there is a very

strong bias toward the reporting of a Street earnings number that exceeds the GAAP earnings number. We also show that the market response to the Street earnings number has displaced GAAP earnings as a primary determinant of stock prices," end quote. Did I read that correctly?
A. You did.
Q. Am I correct that the phrase "primary determinant of stock prices" means that it is -- that the market reacts and analyzes the street earnings more so than GAAP earnings?

A. Well, of course that's not what you originally said.
Q. Well, we are working with the question that's currently posed. Am I correct about that, sir?
A. I agree that this study suggests that investors on average put more weight on street earnings than GAAP earnings, but the study is clear that investors put significant weight on GAAP earnings.
Q. Do you agree, sir, that the study concludes that the primary determinant of stock prices is street earnings, not GAAP earnings; correct?
A. If they say that, I'm not sure if they say that, but that would be --
Q. Sir, isn't the sentence I just read to you a direct quote of primary determinant of stock prices?
A. Again, they may use those words in the abstract.
Q. You agree with me that the -- in this very study the definition of street earnings excludes write-downs and impairments,

are you aware of that?
A. My recollection -- I'd have to spend more time with it -- is that it includes such things as well as other adjustments from GAAP earnings. That's not the only adjustment from GAAP earnings.
Q. Correct. But the street earnings that are the primary determinant of stock prices, as referenced in the article, would exclude impairments; correct?

A. Among other things, yes.
Q. Okay. And if we turn to page -- you don't dispute -- well, withdrawn.
You are aware, sir, that the conclusion reached by Bradshaw and Sloan in this report are based on the regression analysis that they conducted; right?
A. Correct.
Q. And you don't have -- you don't dispute the methodology they use to reach their conclusion, do you?
A. No. I mean, in my review of the paper I -- I didn't see anything that would cause me to have a methodological objection

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to -- to their analysis.
Q. And you don't dispute the interpretation of their results from that regression analysis; correct?
A. Well, again, a little bit, yes. You know, if we just look at Table 1 where they present their regression results, I agree that when street earnings and GAAP earnings are put in what you might call a horse race, more weight is put on street earnings, but GAAP earnings remains statistically significant, meaning investors care about GAAP earnings. They also care about street earnings. And if you want to characterize that horse race as between A and B and say, well, they put more weight on street earnings than GAAP earnings, I would agree with that. But to say that it is -- I don't remember what the phrase was -- determinative or -- I don't remember exactly what they said. You know, let's look at the R-square of that regression. 2 percent. So 98 percent of the variation in stock prices is completely unaccounted by anything that we are discussing. So most of the stock price action

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is not driven by street earnings. So I just -- I would be careful with these words.
Q. Sir, the Bradshaw and Sloan study is not the only one, the only academic study that concluded that investors care more about street earnings than GAAP earnings; isn't that correct?
A. There are other studies which reach

a similar qualitative conclusion, yes.
     Q.   And are you familiar with a study by Dirk Black titled Non-GAAP Reporting: Evidence From Academia and Current Practice?
     A.   I am familiar with it, yes.
     Q.   And that study as well concluded that investors in the market look to street earnings over GAAP earnings; correct?
     A.   I'm less familiar with this one. I've spent a lot less time with this paper. I -- I don't want to quickly agree with your description of their conclusion. Can you just give me a minute to orient myself in the document?
     Q.   Sure. Well, why don't -- why don't you do that during a break, just because I have

limited time, and we can come back to it.
     A.   Okay. As you wish.
     Q.   Dr. Metz, according to your report, you downloaded some 32,000 news articles regarding Rio Tinto; correct?
     A.   I would want to be very careful. I don't think I want to say that I downloaded 32,000 articles in full. I think it might be more correct to say we identified 32,000 articles and downloaded titles and opening sentences of them. I just want to be clear.
     Q.   Okay. That was -- and the 32,000 articles that you downloaded titles and opening sentences from was from a search of Factiva; is that correct?
     A.   I think I describe this in my report. I believe that's the database we use, yes.
     Q.   How did you decide -- well, let me withdraw that.
           How many news articles did you actually download in their entirety from that 32,000 database?
     A.   I -- I don't have that number.

     Q.   How did you decide which articles to download in their entirety?
     A.   Well, my instructions to the team were to review what they had on those articles to determine which ones were relevant to the matter at hand. For example, looking for the

word "Riversdale" or "Mozambique."
Q. And so what -- what were the criteria and instructions you provided beside looking for the words "Riversdale" and "Mozambique" for your team to decide which articles should actually be downloaded?
A. Well, we discussed it. I discussed it with the team, explained what the issues were, and as a very experienced team I'm confident in their ability to flag those articles which are relevant to these issues. As always I say, you know, when in doubt, grab it, but this is a standard operating procedure that we follow in cases like this.
Q. So is it fair to say that you didn't -- am I -- am I to understand that you did not have a precise set of instructions as to what the team should follow to decide

whether the news article was relevant or not?
A. No, I didn't say that. My instructions --
Q. What were --
A. My instructions were to look for articles relevant to this case. I suggested some words and phrases as examples of things that would be relevant, and, as always, said not sure, we will pull it down and take a closer look.
Q. In -- if you could turn to Exhibit 212, which is your opening report.
A. Yes.
Q. In under Rio Tinto News in Exhibit A -- turn to Exhibit A.
A. Uh-huh.
Q. You identify 32 news articles in bullet points under Rio Tinto News.
A. I will take your word for it that it's 32. I haven't counted them.
Q. Okay. Is this the -- is this 32 articles the only ones that you reviewed in connection with your opening report?
A. No.

Q. How many more articles did you review in connection with your opening report?
A. I don't know that number.
Q. Did you understand that you were

supposed to document the documents you considered and reviewed to reach your opinions as part of your obligation as an SEC expert here?
A. Yes.
Q. Is there any document that you or your team created that would accurately identify which news articles you reviewed in connection with your opening report?
MR. BEDNAR: Objection.
A. What -- what do you mean by "reviewed"?
Q. Sir, I'm talking about you have stated that the 32,000 articles were not downloaded, there was just titles and a few sentences, so I am trying to figure out how many articles were actually downloaded and read beyond just the title.
A. And I don't --
Q. Here you have identified 32

articles. I'm trying to figure out how many more articles there are that you downloaded in their entirety.
A. I don't have that number.
Q. Okay. Is there any -- is there any document back in your office or elsewhere that would reflect the news articles you actually -- all of them that you actually reviewed and read in connection with your opening report?
A. So we have moved from downloaded to you, meaning me, reviewed and read. Off the top of my head, I don't know that there is a document of which articles I read. My understanding is I must turn over materials considered, which I believe we have satisfactorily met that requirement.
Q. As you sit here today, you can't advise the court how many news articles you actually read in connection with your opening report; is that correct?
MR. BEDNAR: Objection.
A. You are asking me for a number that I -- I don't have. I didn't keep track. I didn't keep count. I don't --

Q. How about rough, is it over 50, is it over a hundred, is it over 200?

A. My guess is it's in the hundreds, but I -- you are making me guess. I --
Q. You considered, I think we have seen here in your Appendix A, a number of analyst reports as well. It's on the third -- the third page of your appendix. Correct? Third and fourth page.
A. Yes.
Q. And how many analyst reports did you read as part of reaching your conclusions and opinions in your opening report?
A. Again, it's not a number that I kept track of.
Q. So you can't tell the court -- well, let me ask it this way. Withdrawn.
Do you see that on page 4 of your appendix there are some bulleted analyst reports? It looks like about --
A. Yes, I see that.
Q. -- 22 analyst reports identified here.
A. I'll trust that you counted it

correctly, but yes, I see some analyst reports listed on page 4.
Q. And did you personally read all 22 of these analyst reports?
A. I read at least portions, if not the entire document, of all 22 of these, yes.
Q. And did you read any other analyst reports in connection with your opening report other than the 22 that are identified here?
A. I'm sure that I did, yes.
Q. How many additional analyst reports did you read?
A. Again, I didn't keep count. I didn't keep track of that number.
Q. Sir, you do understand you have an obligation to disclose all the materials you considered in reaching your opinions, do you not?
A. Yes, I understand that very well.
Q. Okay. If you can't identify which analyst reports and news articles you considered in reaching your opinions, do you believe you have complied with your obligations?

MR. BEDNAR: Objection.
A. I never said that I couldn't identify the analyst reports that I considered. You are asking me if I can remember how many analyst reports I personally read. If you are equating the word "considered" with the word "read," that's a particular definition of considered. We adopted a broader definition of considered.
Q. What is the --
A. The set of analysts -- the set of analyst reports that we considered, my understanding is we turned over to defense as required.
Q. And so are you aware that you turned over to the defense some 900 analyst reports?
A. Sounds about right. I thought it was 800, but if you say it's 900, that -- I'll accept your representation.
Q. Of those 900 analyst reports, how many did you read?
A. I did not keep count of how many I read. I don't know how often I can say it.
Q. Was it 10 percent or less or more?

A. It was many analyst reports.
Q. Do you believe, sir, that you -- by providing a document dump of thousands of pages of analyst reports and then being unable to identify which ones you actually read and reviewed and considered in connection with your testimony satisfies your obligations as an expert witness in this case?
MR. BEDNAR: Objection. Argumentative. Compound. Vague. Misleading.
Q. Sir, let me withdraw that question.
You want to be an expert, you want to be designated as an expert in this case, don't you?
MR. BEDNAR: Objection. This is argumentative. You are misstating the rules and then asking him about qualifications of an expert. You are not reading the rules correctly.
MR. WEITZMAN: I am asking a different question.
MR. BEDNAR: He is characterizing the rules more accurately than you are.

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MR. WEITZMAN: I am asking a different question at this point.

THE COURT REPORTER: Counsel, I need one at a time.

MR. WEITZMAN: I am asking a different -- I am asking a different question at this point.

Q. Sir, you want the court to qualify you as an expert witness in this case; correct?

A. Yes.

Q. This would be the very first case you have ever been qualified as an expert witness in; correct?

A. Correct.

Q. Do you think that the court should have an understanding in its decision whether to qualify you as an expert witness, that it should understand which materials you reviewed in order to reach your opinions?

MR. BEDNAR: Objection.

A. You are, to my knowledge, introducing a brand new standard I've never heard before. If -- if it was important to know which documents I personally read, had

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that been the rule, I would have been very happy to keep track of it. My understanding is that's not the obligation.

Q. And is that your understanding based on communications with SEC?

MR. BEDNAR: Objection.

A. We had questions about how to interpret the word "considered."

MR. BEDNAR: And I will instruct you not to provide any specifics on your communication.

Q. Sir, you would agree with me that two different analysts can hold different opinions about the very same facts; correct?

A. That sounds like a truism. I mean, opinions about a fact might be words that people would wonder what that means, but I think I understand what you are saying and I would accept that as a truism, yes.

Q. Okay. And you would agree with me that specific to the Rio Tinto January 17, 2013, impairment, some analysts had a certain

reaction to that impairment and other analysts had a different reaction to that impairment, it

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wasn't uniformly viewed the same way by all analysts; correct?
A. Yes, I would agree with that.
Q. And you would agree with me that selecting a single analyst report or single analyst's views is not necessarily representative of the broader view of the market; correct?
A. As a hypothetical?
Q. Yes.
A. Again, that seems -- it's possible that the market could hold a variety of views and no one document or quotation would summarize all the views held by the market.
Q. You would agree with me, sir, that in order to identify a consensus among analysts, the analyst reports need to be reviewed systematically; correct?
MR. BEDNAR: Objection.
A. Systematically, which analyst reports, consensus, I mean, these are all -- it's just a little bit vague to engage on.
Q. It's very confusing to you, that question?

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MR. BEDNAR: Objection. Argumentative.
Q. Dr. Metz, let me ask you this: Did you attempt to identify a consensus view among analysts prior to reaching your opinions in this case?
A. On -- a consensus view around what issue?
Q. Any issue. Did you think it was important to identify a consensus view of analysts when you were relying on analyst reports?
A. Well, I struggle with that question. I guess we would have to define what we mean by the word "consensus." I -- particularly in the context of January 17th my intention was to illustrate a mixed reaction to confounding news by citing some analysts who reacted negatively to the Mozambique write-down and other analysts who reacted positively to the CEO change. I

don't think I represented that -- I'm quite sure I did not represent that all analysts reacted negatively to the write-down or that all analysts reacted positively to the CEO

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change. That wasn't the foundation of my opinion. My opinion was we don't see a significant movement on January 17th, there are reasons we don't see a significant movement on January 17th, and I don't think we learn very much from the absence of a significant movement on January 17th.

Q. My question is a different one.

However you define consensus, did you attempt to identify a consensus view of analysts when you were relying on analyst reports for your conclusions?

MR. BEDNAR: Objection. Vague.

A. I was attempting to illustrate that multiple analysts held certain views at certain times, cite to multiple analyst reports to illustrate the fact that many analysts, or at least multiple analysts held certain views at certain times. I did not represent that it was a unanimous opinion, nor is that -- nor would I ever really expect a unanimous opinion on most things other than the most extraordinary.

Q. Excuse me. Do you -- do you think that the word "consensus" refers to unanimity?

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A. No.

MR. BEDNAR: Objection.

Q. Okay. So let's stick with my question about consensus rather than unanimity. I understand you did not offer the analyst reports as a unanimous view by all analysts.

I am asking whether you ever did an analysis to determine what the consensus view was by analysts as to the matters about which you testified based on analyst reports?

MR. BEDNAR: Objection.

A. Your question is presupposing that these are well-defined concepts with well-defined tests, which somehow I didn't run. These are not well-defined concepts with well-defined tests. I wouldn't -- I wouldn't know if somebody said 'I have established there is a consensus of opinion of X,' what would --

what would that mean. That might mean, for example, that of the reports that person had, which probably is not all reports, but just of the reports that person had, that based on some subjective classification that person would classify perhaps a majority of them as being in

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one way. Okay. That might be one way to go about it, but -- but that's just one way to go about it. And in any event, that's just your classification subjectively arrived at of the particular reports you have in front of you. Does that mean that's a consensus of the market? Somebody might say so, somebody might say -- I mean, this is just not well-defined.

Q. Okay. If we can turn to Exhibit 212 of your -- which is your expert report, and turn to paragraph 65 on page 28.

A. Uh-huh.

Q. In paragraph 65 you say some -- quote -- quote unquote: "Some market analysts described the Riversdale write-down as important and surprising news and suggested that the market moved in reaction to it. For example, one equity analyst interpreted the Riversdale news as the impetus for the initial negative London stock price move." Do you see that?

A. Yes.

Q. Did I read it correctly?

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A. Uh-huh.

THE COURT REPORTER: Sir, could you answer verbally.

Q. In the --

THE WITNESS: I'm sorry.

A. Yes, I believe you read it correctly.

Q. And then in the quote it states, underneath that sentence, quote: RIO's closing market capitalisation last night was $107.7 billion and at the time of writing the share price is down 4 cents -- 4 -- 4 percent -- is that a 4 cents or 4 percent, what is that?

A. 4 percent. 4 percent.

Q. 4 percent or 4.3 billion -- is this

Canadian dollars?
A. I doubt it's Canadian dollars. I mean, I would expect it's U.S. dollars, but --
Q. Okay. I don't know what the "c" refers to. Let me read that again.
A. I think it means a thousand.
Q. Oh, okay. RIO's closing market capitalisation last night was 107.7 billion

dollars and at the time of writing the share price is down the 4 percent or $4.3 billion of market value lost, implying the unexpected nature of the coal impairments. Do you see that?
A. I do.
Q. You would agree with me, sir, that the movement of Rio Tinto stock in London is not relevant to your analysis of Rio Tinto's ADR prices in the United States; correct?
A. Not relevant? I mean, we have established a very close correspondence between the two, so to say it's irrelevant --
Q. Did you conduct -- did you conduct an event study on the Rio Tinto stock on the London Stock Exchange?
A. No, I did not.
Q. Why not?
A. It wasn't necessary for me to form my opinion. I was looking at the ADR and U.S. dollar investors.
Q. Do you agree with me that the JP Morgan report that you are quoting there was written in the middle of or before the close of

the London Stock Exchange?
A. I mean, based on the words, yeah, I would -- it seems so, based on the words, "at the time of writing." I would interpret that to mean that the market hadn't yet closed.
Q. Do you know whether the Rio Tinto stock on the London Stock Exchange ended up flat, up or down for the day following the January 17, 2013, announcement?
A. Offhand, I don't know.
Q. Would it surprise you to learn that the Rio Tinto share price on the London Stock Exchange on January 17, 2013, ended up 10 percent higher?

A. 10 percent higher?
Q. I'm sorry. Not 10 percent. I got the number wrong.
A. That would be --
Q. Yes. Would it surprise -- okay.
Would it surprise you to learn that Rio Tinto's share price on the -- ended up on the day of January 17, 2013, higher than it opened on that day?
A. I have -- it wouldn't surprise me.

We didn't see a significant reaction in the U.S., so I have no particular prior about the reaction I would expect to see.
Q. Would you agree with me that absent an event study, though, the mere fact that the stock price is up or down in the middle of the day says very little about why the stock may have moved on that day?
MR. BEDNAR: Objection.
A. I completely agree.
THE COURT REPORTER: I'm sorry, sir, the answer?
A. I agree, which is, you know, again, why a lot of the analyst commentary assigning value to metal prices is not -- you know, is something we have to take with a giant grain of salt. It takes a lot -- establishing causality takes a lot of work. That's why we are all here today.
Q. Without an event study, you cannot rule out that market forces, industry forces or randomness was the reason for any stock price movement; correct?
A. I am prepared to accept that that's

correct, yes.
Q. It would be pure speculation for an economist to draw a conclusion about the impact of an event on the market based solely on intra-day stock price movements; correct?
A. Not if a proper event study had been conducted, but I assume you mean without an event study.
Q. Without an event study, yeah.
A. Generally, yes, I think if an economist said 'I saw that the price went down and that's because of X' and without any

further analysis, I'd be skeptical about it.
Q. Okay.
A. Journalists, of course, are free to do that all the time.
Q. You are aware, sir, that many of the equity analysts who reported on the January 17, 2013, impairment stated that it did not affect their valuation of Rio Tinto, are you aware of that?
MR. BEDNAR: Objection.
A. I am aware that some analysts said that, yes.

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Q. Have you done any analysis to determine whether analysts changed their target prices for Rio Tinto following the January 17, 2013, announcement?
A. I did not conduct such an analysis.
Q. Are you aware that the overwhelming majority, 16 of 18 analysts, did not lower their target price for Rio Tinto following the January 17th impairment announcement?
MR. BEDNAR: Objection.
A. Well, to be a little more precise, accepting your numbers as correct, 16 of 18 didn't lower their price after the January 17th announcement of writes down -- write-downs and CEO changes and all of the confounding news. It wasn't just a write-down announcement. There was other information there.
(Defendant's Exhibit 300, J.P.Morgan Cazenove, Rio Tinto PLC CEO Steps Down, But $14bn of Writedowns Are Less of a Surprise - ALERT, 17 January 2013, marked for identification.)
Q. Can we turn to Exhibit 300.
A. Uh-huh.

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Q. This is the JP Morgan report, sir, that you quoted in paragraph 65 of your opening report that we just read; correct?
A. Uh-huh.
THE COURT REPORTER: Sir, you have to answer verbally.
Q. And you quoted from --
THE WITNESS: I apologize.
A. Yes.
Q. The title of this JP Morgan report

is, quote: CEO Steps Down, But $14 billion of Writedowns Are Less of a Surprise. Do you see that?
A. I see that's the title, yes.
Q. And if you go to the section at the bottom of the first page titled Valuation & Recommendation, you quoted from the first sentence of that paragraph; correct?
A. I don't remember.
Q. I'm sorry. I couldn't hear you. Can you say that again?
A. Yeah, I recognize that first sentence as a quote that we recently read from my report.
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Q. Okay. You did not quote from the next sentence, so let's read that. It states, quote: We already reflect a $13 billion and $0.6 billion NPV for Aluminum and Mozambique Coal, therefore we see expect negligible impact to our group NPV of $116 billion. RIO remains our preferred pick in the sector, trading at a 12% discount to BHPB on 2013E P/E, and then there is a parenthetical, and a 14% discount on P/NPV, and then there is a parenthetical with numbers.
A. Uh-huh.
Q. Correct? You omitted that sentence from your discussion as to whether this -- according to this JP Morgan analyst the impairment was meaningful in any way; correct?
MR. BEDNAR: Objection.
A. I -- I quoted the first sentence. I -- I didn't quote other sentences, correct.
Q. Was it you who made the decision not to quote the second sentence in this paragraph that reflects that JP Morgan already had a valuation of Mozambique closer to half a billion than 3 plus billion dollars?
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A. I'm responsible for the content of my report.
Q. I understand you are responsible for it. I am trying to find out whether you made that decision.
Did you knowingly omit this sentence from your -- from this block quote that you included in paragraph 65 of your opening

report?
MR. BEDNAR: Objection.
A. Did I knowingly omit? I quoted --
Q. Did you make that decision --
A. There are lots of sentences I didn't quote. In my mind the first sentence was the relevant sentence. I quoted the relevant sentence.
Q. And is it your testimony --
THE COURT REPORTER: I'm sorry?
A. I'm sorry.
Q. Go ahead, sir.
A. The point -- the point was to illustrate that this write-down caught some people by surprise. I didn't say it caught everybody by surprise. I didn't even say it

caught this JP Morgan analyst by surprise. The JP Morgan quote that I provided reinforces that idea, that even in their view, even though they, being smarter than other people, had already written it down, they understand that this impairment was kind of surprising and kind of a big deal and may very well have dropped the stock price. That's all we are getting out of it.
Q. What part of the title of this JP Morgan report where they say $14 billion of write-downs are less of a surprise suggests to you that JP Morgan believed that the write-down was a surprise?
MR. BEDNAR: Objection. Are you asking him only about the title? Or is he allowed to answer based on the entire article?
MR. WEITZMAN: He can also answer based on whatever he sees, including the sentence he omitted from the -- from his expert report, which I read into the record.
Q. You are welcome to answer any of

that, to rely on any of that.
What part of this suggests that it was a surprise to you or that JP Morgan thought it was a surprise?
A. The sentence I quoted suggests that JP Morgan thinks that this write-down

particularly of coal was a surprise to the market. They don't say -- it wasn't a surprise to them. They are very happy to tell you, I'm sure, that they are the smartest guys in the room and they weren't caught by surprise and it was already in their values. But they say that it was generally a surprise to the market, and in their smart thought it may explain why the stock prices were down for a moment. Not me saying that that's why it was down for a moment. I am simply using this as evidence that informed analysts tracking these issues recognized that this was kind of a big deal and something that investors very well may have reacted to, which is exactly what I said in my report.

MR. BEDNAR: Counsel, can I ask for a time check. I think your time is almost

up.

MR. WEITZMAN: Yes, let's get a check on time.

THE VIDEOGRAPHER: We are at 7 hours right now.

MR. WEITZMAN: Can I -- Tom, if I can go off the record and I may be done, but if I can just check with my team, and then if I have two or three more minutes, if I can get that, because there have been some technical glitches as well.

MR. BEDNAR: If it's two or three more minutes.

THE VIDEOGRAPHER: The time is --

MR. WEITZMAN: Let me just check with my team. Off the record.

THE VIDEOGRAPHER: The time is -- excuse me. The time is 6:26 p.m. and we are going off the record.

(Recess was taken from 6:26 to 6:34.)

THE VIDEOGRAPHER: The time is 6:34 p.m. and we are back on the record.

MR. WEITZMAN: Good evening,

Dr. Metz. At this point in time I have no further questions and I yield to co-defense counsel for any questions they may have.

MR. CHEPIGA: This is Geoff Chepiga

from Paul Weiss on behalf of Mr. Elliott.
No questions here at this time. Thank you.
MS. VALLETTE: And I was just going to say the same, this is Jaqueline Vallette from Jones Day. We have no questions on behalf of Mr. Albanese today. Thank you for your time, Dr. Metz.
THE WITNESS: Thank you.
THE VIDEOGRAPHER: That's it?
MR. BEDNAR: Counsel, I have a few clarifying -- before we go off, I have a few clarifying questions. I will try not to be long, because I know it's long in the day. I'm fine with going right into those questions and try to be efficient.
MR. WEITZMAN: That's fine. And yeah, we reserve any -- any time left, the few minutes, to continue questioning after you conclude.

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EXAMINATION BY
MR. BEDNAR:
Q. Dr. Metz, you were asked some questions about your experience as a consulting or testifying expert.
Prior to your work as a consulting and testifying expert in this case, have you ever used event studies to analyze security prices at other times in your career?
A. Several times. That was practice at Moody's, something I've -- I've published on a little bit. So we were frequently interested in understanding whether news or an event impacted some measure of a company's financial strength. Sometimes we might use credit risk measures, like bond spreads or CDS spreads, but sometimes we would use equity prices as a -- as a better proxy, so yes.
Q. And in conducting the event study at issue in this case, did you do anything to consider whether there was other firm-specific news on April 8th, 2011, besides the announcement of the Riversdale acquisition?
A. Of course. You know, as part of our

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practice we -- we download news articles, particularly around key dates of interest. We

reviewed the articles on April 8th and we came across nothing specific to Rio Tinto that would explain sort of positive abnormal return that we observed that day. Nothing else besides the acquisition.

Q. You were asked questions on the subject of your selection of the S&P Metals and Mining Select Index. Do you recall those questions?

A. I do.

Q. You were asked a number of questions about the use of S-I-C or SIC codes.

Is there any requirement that an economist conducting an event study give consideration to SIC codes in selecting an industry index?

A. No. No, there is no such requirement. In fact, in reviewing a lot of the literature on event study methodology, I don't recall seeing reference to SIC codes. I'm not saying it's not there, but I don't recall seeing it.

Q. Are SIC -- sorry. Go ahead.

A. No, go ahead.

Q. Are SIC codes the only kinds of codes that are used in different fields to categorize companies?

A. Oh, no, by no means. They are -- they are common. You know, they have a -- they have a lot of prevalence in the U.S. for U.S. companies. It's a -- it's a somewhat older system. But there are other systems. The Global Industrial Classification system, GICS codes. NAICS codes, North American -- I may get this wrong. North American Industrial Classification System, something like that. These are all different taxonomies that have been developed over time, and, of course, a lot of financial institutions for their own purposes will assign their own codes. Moody's, for example, assigns its own industry code. Ironically enough, that was one of the first projects I did when I joined Moody's, was revamp their entire industry code assignment. I was hired as their industrial economist. They had -- they had an industry code for ink

manufacturer. Well, okay, maybe back in 1937 that was an interesting code to have, but today it really wasn't. They didn't have a telecommunications code. So, you know, we had to revamp the system and, of course, in doing that we took a look at the prevailing different systems, SIC, GICS, NAICS, and so on and so forth, and ultimately settled on our own, because we didn't think any of them was completely satisfactorily. So no, there is nothing -- you know, SIC -- SIC codes are common. I am not saying there is anything wrong with them, but there are certainly alternatives.

MR. WEITZMAN: Object to the narrative and move to strike the extraneous narrative answers.

Q. Doctor, are there any considerations outside of industry codes that are relevant to selecting an industry index?

A. Well, the point of the industry index is to capture all of these things that might be expected to impact equity prices on a sector level. Commodity prices might be one of

those things, but, of course, there are many, many others. So what you are looking for are companies which have, you know, an economic basis to be grouped together, so you have -- you have an economic view that in principle their equity prices should more or less move together and -- and that's really what you are trying to achieve. So it's an economic question of are there -- are there reasons to think that broader factors are going to move these companies, their equity prices, again, that's -- that's what we are tracking, their equity prices, more or less, together. That's essentially what you are trying to achieve with a proper industry index.

Q. Now, specifically within the S&P Metals and Mining Index that you were questioned about today, if a company that's in the S&P Metals and Mining Index has the SIC code for metal mining companies, does that mean that the only companies in that index that have any mining operation have that SIC code?

A. No, of course not. First of all, companies can have many lines of business,

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including metal mining, but it may not be a predominant line of business and so they may choose to represent themselves by some other SIC code. Rio Tinto is sort of an example in reverse, right, they have aluminum manufacturing, but they don't represent themselves as primary metals. And, of course, you have non-metallic mining. You have coal mining, all sorts of mining. So no, it's perfectly possible for a company to have a mining interest, but it's not how it identifies its primary line of business through the SIC code.

Q. And then similarly, if a company has the SIC code for primary metals, the steel companies that you were questioned about --

THE COURT REPORTER: I'm sorry, sir. I'm sorry. I'm sorry. Can I get a repeat of that question.

MR. BEDNAR: Sure.

Q. If a company has the SIC code for primary metals, that is, the steel companies that you were questioned about in the S&P Metals and Mining Index, does that mean that

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none of those companies have any mining operations?

A. You certainly can't assume that. Many of them might be vertically integrated and have some mining operations for inputs into their steel process. No, it doesn't -- it doesn't mean that you only make steel and do not mine. It doesn't mean that at all.

Q. Now, you stated that in preparation for this deposition you analyzed the S&P Metals and Mining Index with the companies that had a SIC code for primary metals removed; is that correct?

A. I did a little bit more than that. I -- I checked not just primary metals, but I removed everything other than SIC 10 to see if an alternative index comprised only of SIC 10 companies would have reversed any of my conclusions.

Q. And what did you find as a result of that analysis?

A. I found that it did not reverse any

of my conclusions. When I constructed that
alternative index, an equally-weighted index

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over those eight companies within SIC code 10
that are identified on April 8th and redid my
event study from scratch, I concluded that the
abnormal return on April 8th was once again
statistically significant. So the presence of
the non-SIC 10 codes is not what was causing
my results and, interestingly enough, the
R-squared of a pure SIC 10 composite is very
slightly lower than the R-squared of the S --
S&P Metals and Mining Index on that day.
Q. When you were assigned with writing
a rebuttal report, did you view your assignment
as including that type of reply in support of
your own event study?
A. No, my -- my understanding was that
that sort of analysis in what might -- what you
might say in defense of my index was out of
scope for the rebuttal report, so I did not
include such analysis in that report.
Q. And you were asked some questions
about your construction of an event study using
a 16-company industry index; is that correct?
A. Yes.
Q. When you performed that analysis in

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your rebuttal report, was that because you
concluded that it was proper to use those 16
companies as an industry index?
A. No. Again, as I explain in the
rebuttal report, as a -- as a general matter, I
don't think that selecting compensation peers
as a general matter is a good guide to forming
an industry index for an event study. You
know, that's not the purpose of those
companies. But I simply wanted to follow
Dr. Hubbard's logic to its, frankly, logical
conclusion. If that was appropriate,
Dr. Hubbard suggests it is, then let's do it,
so let's take all of the names that are
identified in the period of interest and see
what happens.
Q. You were asked some questions about
the inclusion of the company Alcoa in that
16-company index.
A. Uh-huh.

Q. Do you know whether Alcoa has any mining operations?
A. I seem to recall that it does. You know, I could be -- I don't have their

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statements in front of me. I think they do some mining of materials that go into aluminum production. I recall that they are part of Hubbard's 8 index, so to argue that they should be dropped from the set of 16 is a -- is a novel suggestion to make.
Q. And you were also asked questions about the company Potash. Do you know as you sit here today where that company gets its Potash from?
A. My understanding, I could be wrong, is that they mine it. I don't think they purchase it.
MR. WEITZMAN: Objection. Foundation.
Q. And do you know, doctor, whether there are steel companies in the HSBC Mining Index?
A. I don't know. None of us can know.
Q. Why is that?
A. Well, out of the -- and I don't remember the precise numbers, but on the order of 180, 190 constituents, we know at most 10. The rest we don't know who they are or what

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their SIC codes are.
Q. You were asked some questions about the departure of Tom Albanese that was announced in January of 2013.
In the research that you did in preparation of your reports, did you come across any news coverage announcing Tom Albanese's departure prior to January 17th of 2013?
A. No, I saw no such announcements.
Q. Did you come across any news announcing that there would be a search to replace Tom Albanese?
A. I saw no such announcement.
Q. Did you become aware at any time in your research for these reports that Rio Tinto's CFO, Guy Elliott, retired from Rio Tinto in 2013?

A. Yes, I recall he was scheduled to retire in 2013.
Q. You say he was scheduled to retire. What do you mean by that?
A. I think his retirement had been announced. I don't remember when exactly. But

I don't remember when that announcement was made, but he was due to retire at some point in 2013.
MR. BEDNAR: Bear with me for a second. I am trying to find an exhibit.
Q. Dr. Metz, I am putting up on the screen Defendant's Exhibit 279 that was shown to you.
A. Uh-huh.
Q. I will take you to the second page. About halfway down the page there is the section titled A New CEO. Do you see that?
A. I do.
Q. The second sentence says: "Sam Walsh is known to the market, having such a prominent position within RIO, and we view him as a very safe pair of hands." Did I read that correctly?
A. Yes.
Q. Did you come across any other analyst coverage with a similar sentiment with respect to Sam Walsh?
A. I saw a number of analyst reports who thought that Sam Walsh was a good choice as

a replacement for Tom Albanese.
Q. The next sentence says: "It's a little surprising to see both CEO and CFO change in the same year." And then in parentheses: "CFO Guy Elliott has previously flagged he will retire during 2013), although RIO has significant bench strength and good succession planning." Did I read that correctly?
A. Yes.
Q. Did you come across any other analyst coverage portraying the CEO departure as a little surprising or otherwise surprising?
A. Yes. A number of analyst reports used the word "surprise" or some synonym to that to describe the shake-up at the CEO level.

And I think I cite several in my reports.

Q. And let me take down this exhibit. I think -- I think I am done with that exhibit.

You were asked questions about an analyst report that stated that that analyst did not have RTCM in his or her valuation of Rio Tinto. Do you remember that?

A. I do.

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Q. What, if any, relevance does that fact have on your analysis?

A. Very little that I could see.

Q. Why is that?

A. Well, there were -- I can -- I can think of at least one other analyst who expressed something similar, that RTCM was not currently reflected in the valuation. In the context of those statements it seems clear that it wasn't reflected not because it had no value, but because the analysts were unable to model it due to a lack of information. That's point number 1. Point number 2, again, the question at hand or my question about January 17th was not whether these analysts necessarily would change their target prices, but whether investors more broadly might react negatively to the news of the impairment. Though we had an example earlier, some analysts were quick to point out that while they had already valued this properly, nevertheless, they could understand why many and, indeed, generally the market might be caught unaware by -- by the magnitude of that write-down. And that -- that

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was the point that I was trying to get at on January.

Q. If an analyst writes that RTCM was not included in that analyst's valuation for Rio, do you read that as meaning the same thing, that the analyst did not consider the RTCM impairment to be important?

MR. WEITZMAN: Objection. Form. Foundation.

A. No. No. I think it could mean that in a limited sense it's not important to their particular valuation, but that doesn't mean that they don't think it would be unimportant to the market or unimportant in the sense of

indicating other aspects of Rio Tinto. Some analyst reports talk about strategy and one more disappointment and does this call into question oversight and control and corporate control. So even if it doesn't necessarily hit their valuation, it can signal other things even to those analysts.

Q. In your reports you cite to academic literature related to CEO changes.

How does that academic literature

inform the conclusions you reach in your reports?

A. Well, my reading of that literature is that it's supportive and very much on point to the question at hand. That literature finds that when a CEO is forced out and replaced by somebody expected to break with sale policies, that that combination is associated on average with statistically significant positive abnormal returns. That seems to be a very fair description of the news of January 17th.

Q. I am going to show you an exhibit that you were shown, Defendant's Exhibit 286, a Deutsche Bank report from January 17th of 2013. Can you see that on your screen?

A. Yes. I have to magnify it a little bit, but yes, I see it.

Q. Sorry. I think I am on the wrong page. If we go about halfway down the first page, do you see a section titled A Change in Capital Allocation Strategy is a Key Catalyst?

A. I see that, yes.

Q. The Deutsche Bank analyst writes in that section, and I will read from the first

two sentences: "We have highlighted in a series of notes over the last 18 months the need for a change in the capital allocation strategy of the miners. Today's rapid Board response to a second misallocation of capital (Riversdale after Alcan) is the first step in this change in our view with very clear message that capital spending will be subject to increased scrutiny (the next step will be returning the unspent capital to shareholders." Did I read that correctly?

A. Yes.

Q. Did you interpret that Deutsche Bank analyst to be expressing an opinion that the appointment of Sam Walsh represented the status quo?
A. No, I don't think that's a fair way to read that language. It seems clear that this analyst suggests a welcome change in important aspects of corporate management.
Q. Bear with me just a moment.
A. Of course.
Q. I am going to show you another exhibit that you were shown by defense counsel.

The number is Defendant's Exhibit 287.
A. Do you want me to look for it in the binder or are you going to put it up?
Q. I am trying to put it up.
A. I can -- I can get to it. It's pretty close to that. I have -- I have 287 in front of me.
Q. This is an Investec report from the 18th of January, 2013. Under the header New CEO, Same Strategy, But Catalyst For Further Changes, the report begins: With US $14 billion of write downs (more than double the market expectation), relating mainly to its Aluminium and Mozambique Coal divisions, it is not entirely surprising to see a significant shift in senior management. With the departure of Tom Albanese and Doug Ritchie, we expect new CEO Sam Walsh will quickly begin a tough but very process driven approach to further drive costs from the business, particularly the aluminium and coal operations, and accelerate new technologies across the group.
Did I read that correctly?
A. Yes.

Q. And so Investec there is stating an expectation that Sam Walsh will quickly begin a process-driven approach; is that correct?
A. That is what it says, yes.
Q. And Investec -- this particular Investec analyst refers to the change in senior management as a significant shift; correct?
A. Yes, the analyst uses those words.
Q. I'll pull up Defendant's Exhibit 289. Do you see that in front of you?

It's a Nomura report from January 17, 2013, titled Enter Sam Walsh. Do you agree?
A. Yes.
Q. Do you see the subject headers that are in red ink on that page?
A. I do.
Q. What's the second subject header that's in red ink?
A. Significant management change.
Q. Doctor, can you describe for us the approach that you and your team took to considering analyst reports that related to the events of January 17, 2013?
A. Sure. We pull analyst reports from

a third-party database that we have access to. They tag analyst reports related to certain companies. We pulled all the reports they had tagged related to Rio Tinto, and we looked at the reports that were published in and around January 17th and reviewed them for their commentary on the news of that day.
Q. And were you looking only for coverage that was favorable to your report?
A. Of course not. We were looking at all of the coverage. Some coverage was fairly --
Q. And what was your --
THE COURT REPORTER: I'm sorry, sir?
A. Some coverage was fairly silent on the news of the day and other coverage spoke at great length of the news of the day.
Q. You were asked questions by defense counsel about academic research related to the concept of street earnings versus GAAP earnings. Do you remember that?
A. I do.
Q. Are you aware of any peer-reviewed academic literature that concludes that

investors care only about street earnings?
A. No. I think I was even asked that question. I'm not aware of any such study.
Q. Are you aware of any peer-reviewed academic literature that concludes that investors do not care about a firm's strategy?
A. Never seen any such study, no.
Q. Have you ever seen any peer-reviewed

academic literature that concludes that
investors do not care how a firm allocates its
capital?
     A.   Never seen such a study.
     Q.   You were asked some questions about
the topic of credit rating.
           If a credit rating agency does
exclude impairment from the quantitative
aspects of its methodology, does that mean that
the credit rating agency does not consider an
impairment in any aspect of its credit rating
determination?
     A.   No. No, certainly not. That's what
I was responding to when asked that question.
Credit rating agencies look at a lot of things.
They look at historical financials, which are

adjusted in various ways, but they also look
at -- they put in their own projected future
financials. Those projections can be informed
by events like write-downs. So if a company is
having trouble, they may lower their
projections of future earnings, as one example.
And, of course, most methodologies, I'm tempted
to say all, but I won't go that far, but most
methodologies, such as at least Moody's mining
methodology, has qualitative considerations
around business strategy and corporate
leadership and competitive position, and those
qualitative considerations can be adjusted to
account for things like bad acquisitions and
asset impairments. So it's -- it's very
misleading to say that just because in its
standard adjustments of historical data a
rating agency might smooth out an asset
impairment, that it's going to ignore the asset
impairment when forming its credit opinion.
That's just not a fair representation of the
rating process as I understand it.
     Q.   And then, Dr. Metz, I have up on the
screen your -- Defendant's Exhibit 212, which

is your opening expert report, and I am trying
to take you to paragraph 65.
           Do you see that in front of you?
     A.   I do.
     Q.   Now, you were asked questions about
an analyst report that you quote an extract

from in paragraph 65. Specifically you were asked some questions about comments in that report that relate to intra-day movement in Rio Tinto's London stock price.

Did you rely on intra-day movement in London's -- excuse me -- in Rio's London stock price in support of any of the conclusions in this report?

A. No, not at all.

Q. What was your purpose in citing this particular quotation from this particular source?

A. Well, again, the question is whether the Riversdale write-down could have been received by some market participants as significant or important, and this is an analyst who, at least in this analyst's opinion, believes that it not only could be,

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but, in fact, was. Again, I haven't done an analysis to confirm that. I'm not saying that this is why the stock -- the London stock price was down. I'm simply using this to show that an informed equity analyst tracking these events concluded that this write-down was consequential and surprising enough that in this analyst's opinion it could reasonably explain such a drop in stock price.

Q. And did you see anything in this analyst's report that would exclude -- strike that.

MR. BEDNAR: Dr. Metz, I don't have any other questions for you. Thank you for your time.

Is there anything else from defense counsel before we wrap it up?

MR. WEITZMAN: Yes, there is. I'm happy to proceed, but I think we probably will need a break after I go for about five, six, seven minutes, just to confer with co-defense counsel. You went for about forty minutes. I only expect about five minutes. There were some technical

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difficulties which, I think, our stipulations envisioned, paragraph 10, that we would get additional time. In fact, I have been logged out again and can't log

back in, so I apologize for no video.
MR. BEDNAR: Okay, yeah, we are -- I think that we are fine with, you know, five minutes in light of technical issues. I think much beyond that we are starting to get beyond the time that's allotted under the rules or allowed in the stipulations, but if you want to take a short break and get organized, that's great.
MR. WEITZMAN: Why don't -- why don't I go for a few minutes and then we will take a short break and make sure that there isn't anything further.
FURTHER EXAMINATION BY
MR. WEITZMAN:
Q. Dr. Metz, a few -- a few further questions following up on the examination from the SEC.
You were asked questions by the SEC regarding work you did on event studies to

analyze securities prices while at Moody's. Do you recall that?
A. Yes.
Q. And you stated that you conducted such event studies in connection with stock prices, bond spreads, and was there something else?
A. Credit default swaps.
Q. And is it fair to say that you conducted more of those event studies with respect to bond spreads and credit default swaps than stock prices?
A. Not having tabulated it, I expect that would be true. That's usually the measure that we are interested in.
Q. And a rating -- withdrawn.
Is it fair to say that you have never published in a peer-reviewed journal any event studies analyzing securities prices?
A. Well, an event study that I did on -- on -- gosh, I don't remember if it was bond yields or CDS spreads -- I apologize, it was years ago -- on -- on sovereign debts was picked up in a chapter in a book on emerging

market debt. If you want to call that a peer-reviewed journal, maybe technically it's

not, but it was used in a handbook on the issues.
Q. And just to be clear, my question is specific to event studies regarding securities, securities prices.
A. Those are security prices. Yeah, those are securities prices.
Q. Okay. Sovereign debt you are classifying as a security price, like a stock market price?
A. Sure. In this case I think it was -- I think it was their credit default swap spread, but that's a security.
Q. And that was in some textbook?
A. Or a handbook. I don't remember what they called it, but it was a book on emerging debt markets.
THE COURT REPORTER: I'm sorry. "Emerging debt" --
Q. When was that published?
THE COURT REPORTER: Sir, I'm sorry. "Markets" --

THE WITNESS: Emerging markets.
Q. When was that picked up for publication?
A. I don't remember.
Q. Was it in the past ten years?
A. I don't know. It was -- it was a long time ago.
Q. It doesn't appear on your CV; correct?
A. It may not. It was a long time ago.
Q. Okay. You were also asked some questions by Mr. Bednar about an analysis you recently conducted of the SP -- S&P Metals and Mining industry where you reconfigured to only include the SIC -- SIC 10 category of stocks in your analysis; is that correct?
A. Correct.
Q. You conducted that in the past is it one, two, three, four days? How many days has it been since you conducted that analysis?
A. It's been in the past few days.
Q. Okay. And did you have to obtain any new data to conduct that analysis or did you have all that data previously?

A. I imagine we had to pull the stock price data for those eight companies. I'm not sure that we had that lying around.
Q. You had access to that stock price data for the eight companies prior to your -- the issuance of your rebuttal report; correct?
A. Yes.
Q. And how long would you estimate did it take you to run this new analysis, was it a matter of minutes, hours, days?
A. Minutes and hours.
Q. Okay. Did you conduct it or did members of your team conduct this analysis?
A. I asked members of my team to conduct this analysis.
Q. Did you review the results personally?
A. Yes.
Q. And is it fair to say that -- withdrawn.
Do you recall that Professor Hubbard criticized your choice of the S&P Metals and Mining Industry Index in his opening and rebuttal report?

MR. BEDNAR: Objection.
A. In his report. As far as I know, he has just the one report.
Q. Yes.
A. Yes.
Q. And do you recall that one of the criticisms he leveled in his report was the issue surrounding the classification under 610 versus other industries in the S&P Metals and Mining report; correct?
A. I remember he had some discussion on SIC code classifications, yes.
Q. And you understood that your task in issuing -- in coming up with your rebuttal report was to respond to Dr. Metz's report -- I'm sorry -- Professor Hubbard's report; correct?
MR. BEDNAR: Objection.
A. I -- yeah, I think that's too broad. It wasn't just to respond to it. It was to respond to -- in particular ways to particular things. In particular, my understanding was that it was out of scope for me to defend, as an example, the S&P Metals and Mining Index

against Dr. Hubbard's criticisms.
Q. And why was it -- what basis do you have -- withdrawn.
Who told you it was out of scope to defend the S&P Metals and Mining industry you used in connection with your rebuttal report?
A. I --
MR. BEDNAR: I am going to object. Counsel, I need to interject here. I am going to object to the extent that you are calling for the specifics of his communications with us. Part of what you are getting into here is what is rebuttal versus reply, which is a distinction that you have raised in this case and, you know, other than asking him specifically about his conversations with us -- I mean, he told you what his understanding of his assignment was. If you really want to ask him questions about what we told him that you claim the proper scope was, I have to object to that.
MR. WEITZMAN: I think I'm entitled to inquire as to the basis for his

understanding as to what was in scope versus out of scope, considering, first, you elicited that testimony, and secondly, if you provided him an instruction as to what's in scope versus out of scope or assumptions or anything of the sort, that's not a privileged communication. That's not privileged.
MR. BEDNAR: You asked him who told you -- if you want to ask him what his understanding is, ask him what his understanding is. If you want to ask him if he was provided assumptions, you can do that. What you asked him was 'who told you X' and that's obviously calling for his communication with me.
MR. WEITZMAN: If you want to instruct him not to answer that question, you are welcome to do so. I am going to stand on my question.
Q. Dr. Metz, who instructed you that defending the S&P Metals and Mining industry

index and your choice of that index was out of scope with respect to your rebuttal report?

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MR. BEDNAR: I'm going to interpose the same objection. If you want to ask him if he was asked to make an assumption, something that the rule allows you to do, otherwise you are asking a question that is specifically prohibited that is protected under the rules. There is a lot of ways to get what you are looking for that are valid.

MR. WEITZMAN: Okay. Are you instructing him not to answer?

MR. BEDNAR: Yes.

Q. Okay. Sir, who instructed you -- withdrawn.

Did you have conversations with the SEC as to the scope of your rebuttal report before you issued your rebuttal report?

MR. BEDNAR: You can answer yes or no without getting into the content.

A. Yes.

Q. And did you have an understanding following those conversations that a defense of the S&P Metals and Mining industry from the criticisms that Professor Hubbard laid in his

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own report was outside the scope of permitted rebuttal in this case?

MR. BEDNAR: You can answer as to your own understanding.

A. That was my understanding.

Q. Had you considered conducting the supplemental analysis regarding the eight companies with SIC codes 10 prior to issuance of your rebuttal report?

A. I don't specifically recall that that analysis occurred to me prior to issuing the rebuttal report, given my understanding of scope.

MR. BEDNAR: Counsel, you have been going for eleven minutes. How much more do you have left?

MR. WEITZMAN: A few more minutes.

Q. Do you have work product surrounding this supplemental analysis that you conducted in the past few days?

A. Yes.
RQ MR. WEITZMAN: Mr. Bednar, we request production of that work product.
MR. BEDNAR: Sure. Send us a

request and we will respond.
Q. You were asked -- this is the last area that I plan to inquire, although I do reserve to talk to my co-defense counsel.
You were asked about Exhibit 212 -- I'm sorry -- your opening report, paragraph 65 in which you quote from the HSBC analysts. Do you recall that? This concerns the London Stock Exchange movement.
A. Yes.
Q. And you stated that you thought it was important to relay to the court what an, quote unquote, informed equity analyst concluded regarding the movement on the London Stock Exchange. Is that correct?
A. I don't remember if those were my exact words in answering the question or not.
Q. Okay. You have no reason to suspect that the equity analyst who published that report in the middle of the trading day had conducted an event study; correct?
A. No, I have no reason to expect that.
Q. Okay. And you understand that the equity analyst published that report in a

matter of hours into the trading day, presumably; correct?
A. I mean, I -- I don't know the timestamp of the report.
Q. You recall that you testified earlier today that it was issued in the middle of the trading day or sometime before the close of trading in London?
A. I recall agreeing that it was -- by the words there it seems to have been written prior to closing. That's about all I can say.
Q. So you don't know what -- what the analyst in that report did to reach any conclusions as to what might have caused movement in Rio Tinto's stock on the London Stock Exchange midday; correct?
A. Just as I don't know what an analyst does when he says stocks are up because of

metal prices. So I agree, but I don't think this is unique in that respect.
Q. And you would agree --
THE COURT REPORTER: I'm sorry, sir. I didn't hear the end of your answer.
A. I agree, but I don't think it is

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unique in that respect.
Q. You would agree with me that the equity analyst's impressions as to what might be causing the movement of stock, Rio Tinto stock, intra-day in London absent an event study is pure speculation; correct?
MR. BEDNAR: Objection.
THE COURT REPORTER: Sir, in the question did you say "speculation"? I'm sorry.
MR. WEITZMAN: I did.
A. If we want to say then that all analyst reports and all media commentary absent an event study is speculation, this isn't more speculative than the journalist who says stocks are up because metal prices rose. I don't see the difference.
Q. Are they equally --
A. I don't -- I don't think that journalist or analyst conducted any sort of an event study or statistical analysis to determine that spot commodity prices were causally related to an increase in a bunch of equity prices, I don't --

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Q. Just to understand, is it your view then that they are equally speculative, both the analysts who are talking about metal price movements and the analysts who are talking about the movement of Rio Tinto stock on the London Stock Exchange on January 17?
MR. BEDNAR: Objection.
A. I have no reason to believe that either one reached a conclusion based on an event study.
Q. And in your field an event study is what's the minimum that's required to make a generally accepted (inaudible) --
THE COURT REPORTER: I'm sorry. Sir, I'm sorry, you broke up. Sir, I'm sorry, you broke up. I need a repeat of

that question.
Q. Sir, in your field of economics you can't reach conclusions about the cause of stock price movements without at a minimum conducting an event study; correct?
A. You have the word "can't." The -- a commonly accepted practice to try and determine forms of loss causation is to run an event

study. That's why Dr. Hubbard and I are not relying on media commentary, but are conducting event studies. I'm not -- for example, there is a media report that says Rio Tinto is up because of the acquisition, right? I'm not relying on that to form my opinion. I conducted an event study to form my opinion. But to disparage this particular's analyst's comment as somehow worse or less reliable than other analysts, I don't understand on what basis you want to make that disparagement.
MR. WEITZMAN: If we can take a break so I can confer with joint defense counsel.
THE VIDEOGRAPHER: The time is 7:33 p.m. and we are going off the record.
(Recess was taken from 7:33 to 7:36.)
THE VIDEOGRAPHER: The time is 7:36 p.m. and we are back on the record.
MR. WEITZMAN: Dr. Metz, thank you for your time today. We have no further questions on behalf of Rio Tinto.
THE WITNESS: Thank you very much.

MR. WEITZMAN: Thanks, everyone. Thanks to the reporter and videographer especially.
THE VIDEOGRAPHER: No problem. The time is 7:37 p.m. and this ends the deposition of Albert Metz.
(Discussion off the record.)
THE VIDEOGRAPHER: The time is 7:37 p.m. and we are back on the record.
MR. WEITZMAN: Tom, there were a number of instances where I requested documents and analyses, including supplemental analysis that had not previously been disclosed. Upon production

of those materials we may seek to reopen the deposition and I reserve the right to seek to reopen the deposition, notwithstanding that we are closing it today.

MR. BEDNAR: Okay. We reserve the right to object to that. If you could put your requests into some form of writing just so that we know that what you said in the deposition is exactly what you want,

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that would be helpful, but we will respond to those requests.

MR. WEITZMAN: Great. Thank you. And now I am truly done.

THE VIDEOGRAPHER: Okay.

MR. WEITZMAN: Thank you, Dr. Metz.

THE VIDEOGRAPHER: The time is 7:38 p.m. and, once again, this ends the deposition of Mr. Albert Metz.

(Time noted: 7:38 p.m.)

ALBERT DIEDERICH METZ

Subscribed and sworn to before me this day of 2020.

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C E R T I F I C A T E

STATE OF NEW YORK)
) ss.:
COUNTY OF NASSAU)

I, KRISTIN KOCH, a Notary Public within and for the State of New York, do hereby certify:

That ALBERT DIEDERICH METZ, the witness whose deposition is hereinbefore set forth, was duly sworn by me and that

such deposition is a true record of the testimony given by such witness.

I further certify that I am not related to any of the parties to this action by blood or marriage; and that I am in no way interested in the outcome of this matter.

IN WITNESS WHEREOF, I have hereunto set my hand this 22nd day of June, 2020.

KRISTIN KOCH, RPR, RMR, CRR, CLR

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Page 42	Engagement letters
119	Supplemental production of documents that Dr. Metz reviewed that reflect the constituents of the S&P Metals and Mining Index and the dates on which he received or reviewed those constituent lists
348	Work product surrounding supplemental analysis

0362

ERRATA SHEET FOR THE TRANSCRIPT OF:

Case Name: SEC v. Rio Tinto
Dep. Date: June 17, 2020
Deponent: Albert Diederich Metz

CORRECTIONS:

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Signature of Deponent

SUBSCRIBED AND SWORN BEFORE ME
THIS____DAY OF____________, 2020.

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(Notary Public) MY COMMISSION EXPIRES:_______

EXHIBIT 6

UNITED STATES DISTRICT COURT
SOUTHERN DISTRICT OF NEW YORK

SECURITIES AND EXCHANGE COMMISSION,

Plaintiff,

v.

RIO TINTO PLC, RIO TINTO LIMITED, THOMAS ALBANESE, and GUY ROBERT ELLIOTT,

Defendants.

No. 1:17-cv-7994

EXPERT REPORT OF ALBERT METZ, PH.D.

December 20, 2019

Defs.' Ex.

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exhibitsticker.com

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I. INTRODUCTION

1. I, Albert Metz, am a PhD economist specializing in econometrics and statistics, finance, institutional and consumer credit, real estate, risk modeling and assessment, and numerical methods. I am a Managing Director at Global Economics Group, Inc., a Chicago-based firm which specializes in the application of economic theories and principles to a variety of contexts, including in litigation involving antitrust, labor, intellectual property, finance, statistics, and valuation issues.

2. My work focuses on matters involving fraud, conspiracies and manipulations, with an emphasis on financial markets, particularly fixed income and commodities markets. I specialize in the detection of this type of behavior, the assessment of market impact, and the quantification of damages, both in standard one-side markets and in multi-sided platforms.

3. Prior to joining Global Economics Group, I was employed by Moody's Investors Service for fifteen years where, among other responsibilities, I managed the Global Methodology Development Group, which had sole responsibility for developing credit rating methodologies and econometric and statistical models for all rated financial instruments globally. I also managed the Credit Policy Research Group which conducts research on corporate, municipal, sovereign and financial institution credit issues. As a result of my experience in statistics, finance and risk modeling, much of my career has been spent analyzing and making inferences about how quickly and reliably, and to what degree, new information impacts securities prices.

4. I have been asked by the Securities and Exchange Commission ("SEC") in this matter to: (i) examine and opine on whether the market for Rio Tinto American Depository

Receipts (ADRs)[1] was efficient prior to the time Rio Tinto acquired the Riversdale[2] mining assets through the day it wrote off most of the Riversdale acquisition, that is, from at least December 2010 through January 17, 2013 (the "period of interest"); (ii) examine and opine on the impact and importance of new information released to the market on the price of Rio Tinto's U.S. exchange-traded ADRs on various days throughout this period of interest, including the day of acquisition and the day Rio Tinto disclosed the write-off; (iii) describe reasons why the ADR price movement on January 17, 2013 may have been affected by other news in addition to the impairment announcement; and (iv) provide general background on bonds, the bond market, and Rio Tinto's issuance of certain bonds during the period of interest.

5. The materials I have considered in forming my opinions are summarized in **Appendix A**. Global Economics Group is being compensated at an hourly rate of $700 per hour for my work on this matter, and at rates between $150 and $400 for members of my staff who performed work in connection with this report under my direction and supervision. My compensation is in no way contingent on the outcome of this case. My qualifications are described below.

II. QUALIFICATIONS

6. I received my Ph.D. in Economics from the University of Chicago, where I specialized in finance, monetary economics, statistics and econometrics and numerical methods. I was the first student to be awarded Distinction in Econometrics by the Economics Department.

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[1] American Depository Receipts (ADRs) and American Depository Shares (ADSs) are often used interchangeably. *See* https://www.sec.gov/investor/alerts/adr-bulletin.pdf.

[2] Rio Tinto later renamed Riversdale "Rio Tinto Coal Mozambique," but for ease of exposition, I refer to it as Riversdale throughout this report.

I also received my M.A. in Economics from the University of Chicago and my B.A. in Economics from Occidental College, where I graduated summa cum laude.

7. Prior to my career as an economic consultant, I was an economist at Security Capital Group, a Chicago-based real estate investment and management company. I also worked as an economist at the Congressional Budget office. For the past fifteen years, I was employed at Moody's Investors Service specializing in corporate, financial institution, sovereign and structured finance credit research and modelling. There I developed numerous econometric models of corporate and consumer credit as well as credit rating transitions.

8. Most recently, I was the Managing Director of the Global Methodology Development Group, a team of nearly 100 professionals with responsibility for developing credit models and methodologies for all asset classes across all lines of business. I frequently met with U.S., European, and Asian regulators and policy makers to discuss credit risk, credit ratings performance, risk modeling, and regulatory and antitrust and other policy matters. Before leading the Methodology Development Group, I was the Managing Director of Credit Policy Research at Moody's with responsibilities including Default Research, Model Development and Verification, and Technology.

9. I have developed patented models of default and credit rating transitions and trademarked models of regional real estate prices. I have developed models of residential mortgage default, prepayment and loss which have been used to assess the credit risk of hundreds of billions of dollars in securitizations. I have also developed several models of corporate and consumer credit, financial risk contagion, real estate market performance measures, and pharmaceutical drug development, among others. In addition, I frequently

conducted event studies to assess the impact of credit actions and announcements on corporate and sovereign costs of capital.

10. I have authored and co-authored articles in peer reviewed journals, trade publications, and Moody's Special Comments on subjects such as credit rating performance, corporate and sovereign defaults, collusion, manipulation, and screening. I have also contributed a chapter for a book on emerging markets and sovereign risk which was based, in part, on an event study analysis.

11. Part of my research over the last decade has focused on fraud, collusion, and manipulation, including the development of empirical methods known as "screens" to flag the possibility of such practices. Some of my research assisted in launching large scale investigations into financial and commodities markets. As an example, in 2008 I co-authored a research paper about a potential conspiracy by certain financial institutions to manipulate the London Interbank Offered Rate (LIBOR)—a benchmark interest rate. My co-authors and I first put forward the possibility that collusion may have been ongoing in the setting of LIBOR from significantly earlier than the start of the financial crisis. To date, billions of dollars in settlements have already been collected by authorities around the world.

12. Another example of my work on conspiracies and manipulations relates to the London Gold and Silver Fixings. In early 2014 I co-authored a paper that first pointed out the possibility of a gold conspiracy and manipulation of spot price fixings. This trigged the launching of governmental investigations around the world and dozens of private complaints.

13. As an economic consultant, I have worked for defendants, plaintiffs, and governmental agencies in matters involving fraud, conspiracies and manipulations, and multisided platforms. I have worked both in assessing liability as well as in estimating damages.

14. My qualifications are further detailed in my curriculum vitae, which is attached as **Appendix B**. My curriculum vitae lists all of my publications from the last ten years. I have not previously testified as an expert.

III. SUMMARY OF OPINIONS

15. After analyzing Rio Tinto ADRs in light of an array of efficiency factors, I have concluded that the market for Rio Tinto ADRs was efficient during the period of interest, from the months leading up to when Rio Tinto acquired the Riversdale mining assets through at least when it wrote off most of the Riversdale assets.

16. After analyzing the market's reaction to Rio Tinto's acquisition of the Riversdale mining assets on April 8, 2011, I conclude that this acquisition was accretive. The market believed that these assets had upside for Rio Tinto and this was reflected in a statistically significantly positive excess return in the ADR price that day.

17. The market reacted negatively, but not significantly, to the $3 billion Riversdale write-down and other news announced on January 17, 2013. The news of the write-down was released simultaneously with news of additional write-downs in other assets and a change in leadership of Rio Tinto. The academic literature finds that both the removal of an underperforming CEO as well as the hiring of a capable CEO can be associated with positive abnormal equity returns. The market learned of both these events at the same time negative news regarding Riversdale and another mining asset was announced.

18. Taken together, the equity market reacted significantly positively to the acquisition of the Riversdale mining assets. Upon hearing the official announcement from the Company that the mine was nearly worthless, the equity market did not react with a corresponding decline. This is not unexpected since the market learned of a change in senior management of the Company at

the same time it learned of the write-down, and this change was very well received by analysts. It is also possible that some of the weaknesses of the Riversdale mining assets were already known to the market by the time of the official write-down. This, too, would tend to limit the degree of price reaction on January 17, 2013.

19. The remainder of this report is organized as follows: **Section IV** of this report provides an overview of Rio Tinto and the allegations in this case. **Section V** explains the event study methodology, while **Section VI** describes some of its limitations. **Section VII** documents the ADR price movement at the time of the Riversdale acquisition. **Section VIII** reviews the news released on January 17, 2013. **Section IX** provides a brief primer on bonds and the bond market. **Section X** concludes. **Appendix A** lists the materials I have considered in forming my opinions, while **Appendix B** details my curriculum vitae. Finally, **Appendix C** provides evidence that Rio Tinto ADRs traded in an efficient market during the period of interest by reviewing the so-called *Cammer* factors and other factors that financial economists and courts (including in this Circuit) consider when evaluating market efficiency under the "fraud on the market" theory.

20. I reserve the right to amend this report, including to reflect new information that becomes available to me in light of the discovery process and/or future rulings from the Court.

IV. OVERVIEW OF THE COMPANY AND ALLEGATIONS

21. Rio Tinto (the "Company") is an international mining group comprised of Rio Tinto Limited, with shares sold on the Australian Securities Exchange, and Rio Tinto plc, with shares sold on the London Stock Exchange. Thus the equity shares are dual listed, and "designed to place the shareholders of both Companies [Rio Tinto Limited and Rio Tinto, plc] in substantially the same position as if they held shares in a single entity owning all of the assets of

both Companies."[3] In the U.S., Rio Tinto plc's ordinary shares[4] trade on the New York Stock Exchange ("NYSE") in the form of American Depositary Receipts with J.P. Morgan Chase as depositary and transfer agent.[5] ADRs are negotiable U.S. securities, issued by U.S. depositary banks, which represent a fraction of a share to multiple shares of a foreign company's publicly traded equity depending on the particular terms of the ADR issuance.[6] In this case, one ADR represents one Rio Tinto plc ordinary share.[7]

22. Throughout the period of interest, Rio Tinto plc's common stock traded on the London Stock Exchange while the ADRs traded on the NYSE. One would expect, and the financial literature confirms, that prices for these securities would move together after taking into account the conversion ratio and exchange rate.[8] **Figure 1** below shows the correspondence between the prices in Rio Tinto ADRs and the underlying ordinary shares.[9]

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[3] Rio Tinto 2012 Annual Report, p. 127.

[4] "Ordinary shares are the most common form of share in the UK. An ordinary share gives the right to its owner to share in the profits of the company (dividends) and to vote at general meetings of the company." https://www.londonstockexchange.com/traders-and-brokers/security-types/ordinary-shares/ordinary-shares.htm.

[5] Rio Tinto 2012 Annual Report, pp. 127-130.

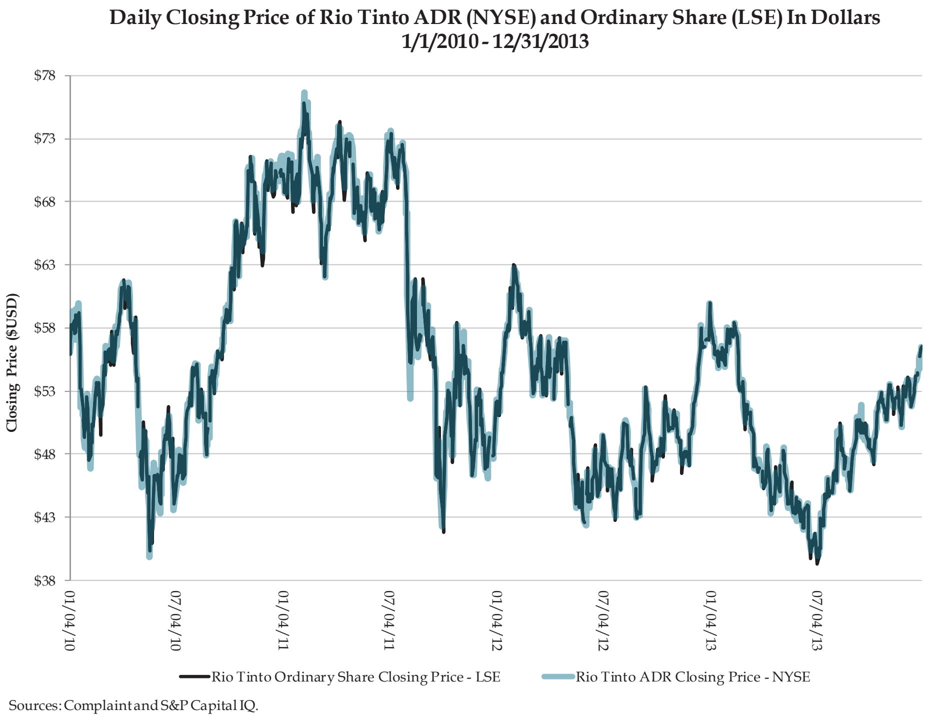
[6] *See* https://www.sec.gov/investor/alerts/adr-bulletin.pdf.

[7] Rio Tinto 2012 Annual Report, p. 130.

[8] Choel S. Eun & Sanjiv Sabherwal, "Cross-Border Listings and Price Discovery: Evidence from U.S.-Listed Canadian Stocks," *The Journal of Finance* Vol. 58 (2), 2003, pp. 549-575.

[9] Apparent differences may be explained in part by differences in active market hours between New York and London. *See*, https://www.tradinghours.com/exchanges; https://www.nyse.com/markets/hours-calendars; https://www.londonstockexchange.com/products-and-services/technical-library/millennium-exchange-technical-specifications/millennium-exchange-technical-specifications.htm. Using Eastern Standard Time, NYSE trading hours are 9:30 AM to 4:00 PM ET and the London Stock Exchange trading hours are 3:00 AM to 11:30 AM ET.

Figure 1



23. Rio Tinto's earliest operations began with the Rio Tinto Mine in Spain during the late 19th century, and the Company has grown to become one of the largest mining companies in the world.[10] Rio Tinto described its business during the period of interest in this matter as follows:[11]

> Rio Tinto is a leading international mining group that focuses on finding, mining and processing the Earth's mineral resources in order to maximise shareholder value. We have a diverse portfolio and a global presence: our 71,000 people work in more than 40 countries.
>
> To deliver superior returns to shareholders over time, we take a long-term and responsible approach to our activities. This means concentrating on developing first-class orebodies into large, long-life and efficient low-cost operations, capable of providing competitive returns through business cycles.
>
> Sustainable development is integrated into everything we do. Our operations give us the opportunity to bring long-lasting positive change to the communities, regions and countries in which we work, and our metals and

[10] https://www.riotinto.com/aboutus/history-4705.aspx.

[11] Any **bold** font emphasis in this report is added by me unless specified otherwise.

> minerals are transformed into end products that contribute to higher living standards.
>
> Our responsible approach to mineral development ensures we gain and maintain our licence to operate. It means we provide confidence to our stakeholders, and improve our access to the mineral resources, people and capital we need. Our five product groups summarised below are supported by our Exploration and Technology & Innovation groups.[12]

24. In 2010, prior to acquiring control of the Riversdale mining assets, Rio Tinto employed over 77,000 people and operated in over 40 countries, with earnings of $14 billion, cash flows from operations of $23.5 billion and EBITDA of $26 billion.[13] In its 2013 Annual Report, the Company indicated that it had earnings of $10 billion, cash flows from operations of $20 billion, EBITDA of $21 billion, and employed approximately 66,000 people.[14]

25. According to the Complaint filed on October 17, 2019,[15] Chief Executive Officer Thomas Albanese ("CEO Albanese") and Chief Financial Officer Guy Robert Elliot ("CFO Elliot", together with CEO Albanese, the "Individual Defendants") and Rio Tinto deceived investors with regard to the true value of its Riversdale mining assets in Mozambique, Africa soon after acquiring it.[16] The Company acquired Riversdale in April 2011 for $3.7 billion, but on January 17, 2013, the Company wrote off the majority of the assets. According to the Complaint, Defendants allegedly withheld information prior to the write-off that would have allowed the market to understand the declining value of Riversdale at an earlier date.[17]

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[12] Rio Tinto 2012 Annual Report, p. 2. The five product groups are Aluminum, Copper, Diamonds & Minerals, Energy, and Iron Ore (pp. 2-3).

[13] Rio Tinto 2010 Annual Report, cover through p. 2.

[14] Rio Tinto 2013 Annual Report, cover through p. 3 and p. 198.

[15] "Securities and Exchange Commission, Plaintiff, v. Rio Tinto plc, Rio Tinto Limited, Thomas Albanese, and Guy Robert Elliott, Defendants." No. 1:17-cv-7994, United States District Court for the Southern District of New York, filed October 17, 2017 ("Complaint").

[16] Complaint ¶¶ 1-2. For purposes of this report, I am not opining on whether the Complaint allegations are true.

[17] Complaint ¶¶ 3-9.

26. The Complaint further alleges that the Company profited from this misinformation when it issued $5.5 billion in U.S. bonds and notes where the prospectuses for those bonds contained false information about the Riversdale mining assets, information that was known to be false by the Individual Defendants.[18]

V. EVENT STUDY METHODOLOGY

27. Prior to discussing the market reaction to the relevant events in this matter, it is worthwhile to discuss the methodology used to establish the relationship between Company-specific news and changes in the market price of its equity shares (i.e., the ADR price).

28. My analysis assumes that Rio Tinto ADRs traded in an efficient market, one in which widely-available public information is quickly incorporated into the market price of a security and where all purchasers implicitly rely on any material misrepresentations or omissions since the value of those misrepresentations or omissions is incorporated into the market price. In **Appendix C**, I present an analysis over the period of interest that shows that Rio Tinto ADRs traded in an efficient market.

29. The Nobel prize winning economist Dr. Eugene Fama described an "efficient market" as one in which all public information is reflected in a security's market price and security prices adjust to new publicly available information (information which might be false) rapidly and in an unbiased fashion so that it is impossible to earn excess returns by trading on

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[18] Complaint ¶ 6.

that information. Under this form of efficiency (called "semi-strong"), neither fundamental nor technical analysis can produce consistent excess returns.[19]

30. A technique often relied upon (both inside and outside the context of litigation) to establish such a causal connection between news and price is called an "event study." An event study is a well-accepted statistical method utilized to isolate the impact of information on market prices.[20] Event studies have been used for over 40 years and have appeared in hundreds if not thousands of academic articles as scientific evidence in evaluating how new information affects security prices.[21]

31. An event study is conducted by specifying a model of *expected* price movements and then testing the extent to which *actual* price movements differ from those expectations. The critical question an event study answers is whether the difference between actual and expected price movements is so great that randomness alone can be scientifically rejected as the cause of the deviation.

32. What does it mean to "reject randomness as an explanation?" In this context, "randomness" refers to the tendency for *actual* outcomes (in this case, the actual security price) to deviate from average or *expected* outcomes in ways which appear random in nature. I will develop a very simple example to illustrate these ideas. Suppose that "Firm A" flips a coin 100 times each day, and the stock return of "Firm A" is equal to the percentage of times the coin

[19] Eugene F. Fama, "Efficient Capital Markets: A Review of Theory and Empirical Work," *The Journal of Finance* Vol. 25 (2), 1970, pp. 383-417.

[20] A. Craig MacKinlay, "Event Studies in Economics and Finance," *Journal of Economic Literature* Vol. 35, 1997, pp. 13-39 at p. 13.

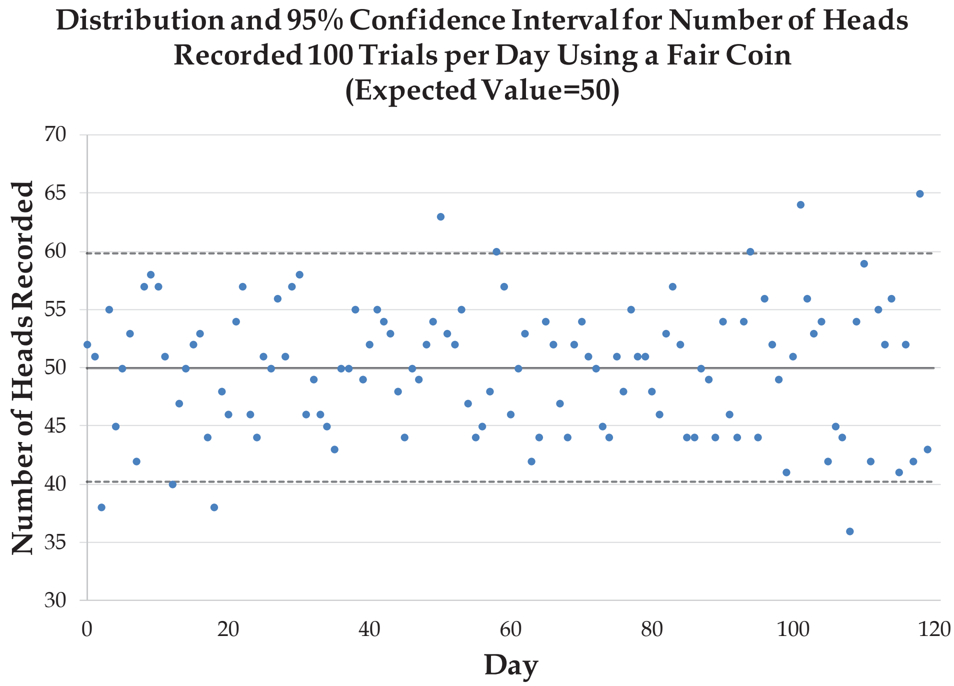
[21] John J. Binder, "The Event Study Methodology Since 1969," *Review of Quantitative Finance and Accounting* Vol. 11, 1998, pp. 111-137 at p. 111.

comes up Heads. Suppose that we know that the coin is fair, meaning there is a 50/50 chance of getting Heads.

33. How many Heads do we *expect* to see each day? Of course, we expect out of 100 flips of a fair coin to record 50 Heads each day. But our experience tells us that we will not always record 50. Some days we will record a few more, and some days a few less. The *actual* outcomes will sometimes (maybe even often) differ from the *expected* outcome.

34. **Figure 2** below presents some simulated data of this process: 100 random flips each day for 120 days, each flip having a 50% chance of generating a "Head." In this batch of simulated data, we average 49.97 Heads each day. However, we recorded *exactly* 50 Heads on only 9 out of the 120 days. Statisticians have a well-developed understanding of this problem and use what are called "confidence intervals" to describe the likelihoods of different outcomes. **Figure 2** plots the expected number of Heads (50) and the statistical 95% confidence interval (indicated by the dotted lines at 40 and 60). The "95% confidence interval" means that there is only a 5% chance of observing an outcome which is outside the interval: 95% of the time the number of Heads will range between 40 and 60, and only 5% of the time will it be less than 40 or more than 60.

Figure 2



35. What do we conclude from this? It would seem that "random variation" can account for outcomes ranging from 40 to 60 from Firm A flipping a fair coin.

36. Now suppose that tomorrow, Firm A will purchase a new coin which might (or might not) be differently weighted. If tomorrow we record 42, or 58, or 47, or indeed any number of Heads between 40 and 60, we would not regard such an outcome as unusual for flipping a fair coin. In other words, we could not reject the hypothesis that Firm A was still using a fair 50/50 coin in order to generate returns.

37. But what if instead we record 65 Heads? That represents a deviation of 15 away from our expectation of 50 and is well outside the "95% confidence interval." Statistically we can say that the likelihood of observing an *actual* outcome which is 15 or more away (whether 15 too high or 15 too low) from our expected outcome is less than 0.5% (i.e., this would occur approximately once in 300 days). While we cannot say that such an outcome is impossible from

a fair coin, we can say that it is highly unlikely. Instead, it is more likely that the weight of the coin has changed. Suppose further that we find news reports indicating that Firm A was hoping to purchase a heavier coin designed to produce more Heads. This qualitative information, combined with our statistical observation, suggests that the statistical results were most likely caused by the actual purchase of a new coin with a non-50/50 weight. This is the basic logic applied in an event study methodology.

38. Returning to the matter at hand, I perform an event study by specifying a model of expected price movements and then testing the extent to which actual price movements differ from those expectations. A well-accepted method for performing an event study is to estimate a market model based on a regression over some period of time (an "estimation window") to quantify the typical relationship between the market price of the relevant security on the one hand and broad market factors on the other.[22] Specifically, I evaluate the relationship between Rio Tinto ADRs' daily returns (percentage change in closing price) controlling for the daily returns of the S&P 500 Total Return Index (the "Market Index") and the S&P Metals and Mining Index (the "Industry Index").[23, 24]

39. To analyze the effect that news announced on a particular day (the "event day") had on Rio Tinto's ADR return, I construct a regression model using data from the prior 120 trading

[22] A "regression" or "regression model" is a statistical technique for measuring the ability of one or more variables (the "independent variables") to "explain" another variable of interest (the "dependent variable"). In this case, the daily percentage change in Rio Tinto ADRs (the ADR daily return) is the dependent variable and the contemporaneous daily returns for a market and industry index are the independent variables. For a general discussion of regression analysis, *see* Damodar N. Gujarati, *Basic Econometrics* (3rd ed., 1995), McGraw Hill, Chapters 1-3.

[23] Rio Tinto plc compares itself to the HSBC Global Mining Index; the S&P Metals and Mining Index is an appropriate peer index for the US traded ADR.

[24] David I. Tabak & Frederick C. Dunbar, "Materiality and Magnitude: Event Studies in the Courtroom," *Litigation Services Handbook, The Role of the Financial Expert* (3rd ed., 2001), Chapter 19; A. Craig MacKinlay, "Event Studies in Economics and Finance," *Journal of Economic Literature* Vol. 35, 1997, pp. 13-39.

days (roughly six months) up to but not including the event day.[25] In this model, I regress the ADR return on a constant, the Market Index return and the Industry Index return. Formally, I estimate the following equation ("**Equation 1**"):

$$RIO_t = \alpha + \beta_1 Market_t + \beta_2 Industry_t + \varepsilon_t$$

40. Here, RIO_t is the Rio Tinto ADR return on date *t*, $Market_t$ is the return on the S&P 500 Total Return Index on date *t*, $Industry_t$ is the return on the S&P Metals and Mining Index on date *t*, and ε_t is the random factor on date *t*.[26]

41. By using a "rolling" estimation window (that is, an estimation period which changes with the event day), I allow for the relationship between the Rio Tinto ADR on the one hand and industry and market factors on the other, as well as the volatility of the random factor, to change over time. Use of a rolling model to account for changing volatility and evolving relationships among market indices is accepted in peer-reviewed literature.[27]

42. I then use the model to measure the unexpected or abnormal return on the event day, and to form a measure of the statistical significance of that abnormal return. The "abnormal return" is simply the difference between the actual return observed on the event day and the expected return predicted by the regression model for the event day. The "statistical significance" of that abnormal return reflects the uncertainty of the market model.

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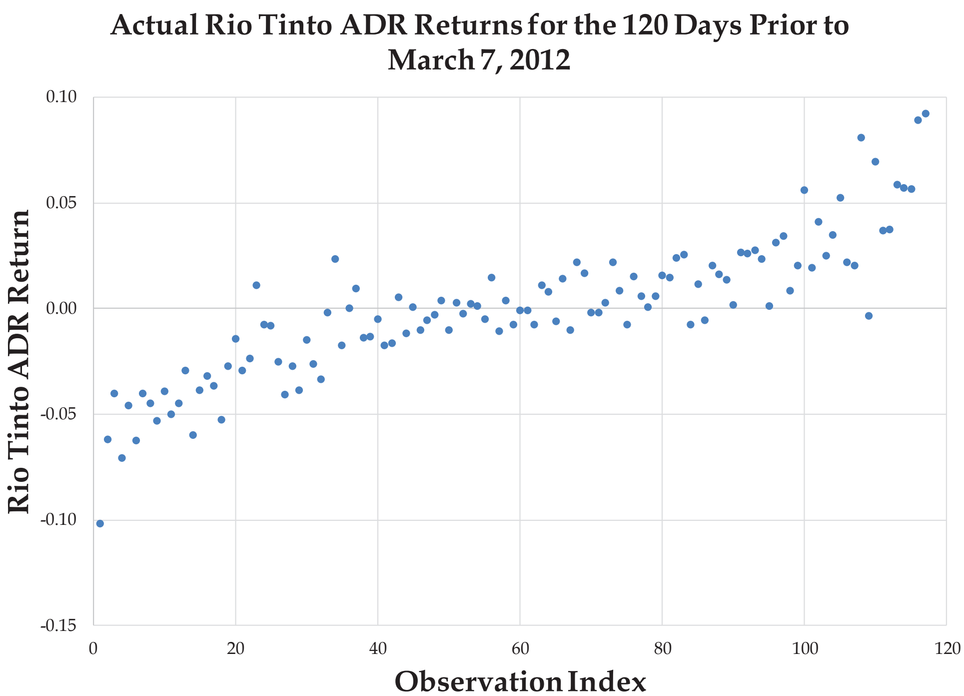
[25] A. Craig MacKinlay, "Event Studies in Economics and Finance," *Journal of Economic Literature* Vol. 35, 1997, pp. 13-39 at p. 15: "For example, in an event study using daily data and the market model, the market model parameters could be estimated over the 120 days prior to the event."

[26] In the "coin flipping" example, this random factor accounts for the differences between the actual number of Heads and the expected number.

[27] Phillip A. Braun, Daniel B. Nelson, & Alain M. Sunier, "Good News, Bad News, Volatility, and Betas," *The Journal of Finance* Vol. 50 (5), 1995, pp. 1575-1603 at pp. 1575, 1597.

43. An example may help clarify. Consider whether the Rio Tinto ADR return for March 7, 2012 (a day selected at random) of 0.76% is statistically significantly different from expectations. To test this, I first estimate the regression model (Equation 1) based on the 120 trading days prior to (but not including) March 7, 2012.[28] These data are presented in **Figure 3** below.[29]

Figure 3



44. The estimated coefficient for the Market Index (β_1 in Equation 1) is 0.85 which means that a 1% rise in the Market Index predicts a 0.85% increase in returns for Rio Tinto ADRs, holding the Industry Index constant. The estimated coefficient for the Industry Index (β_2 in Equation 1) is 0.58, meaning that the expected return for Rio Tinto ADRs increase 0.58% for

[28] From this set of 120 trading days I then exclude earnings announcements.

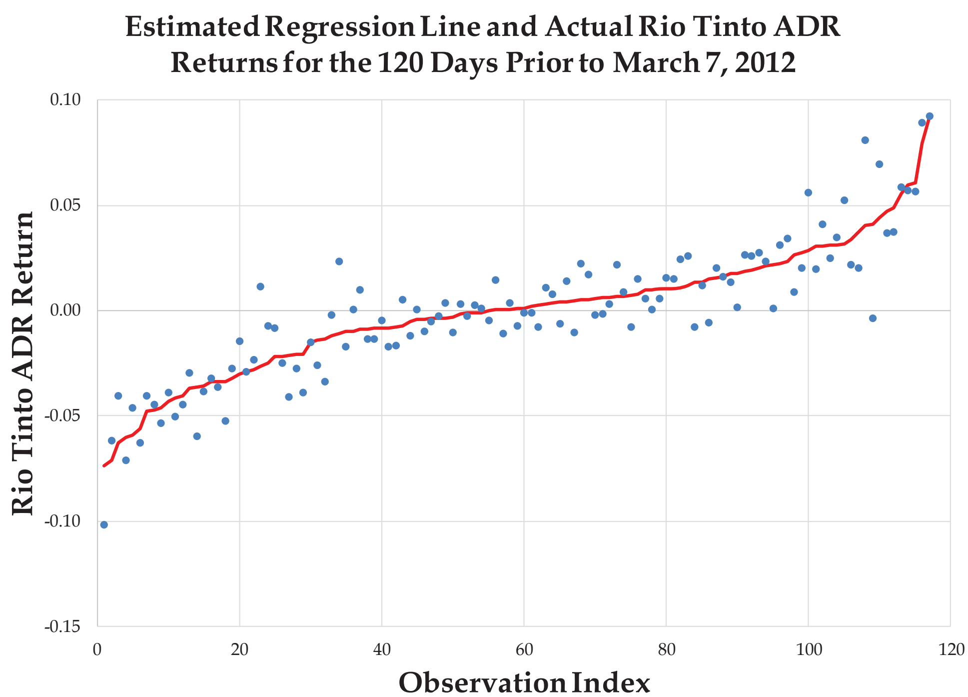
[29] For the benefits of presentation, the data are not presented in chronological order but are instead sorted in the order of the fitted regression line, described later.

every 1% increase in the Industry Index, holding the Market Index constant. The estimated coefficient on the constant (α in Equation 1) is -0.09%. The data on Rio Tinto's returns shown in Figure 3 can therefore be modeled as follows ("**Equation 2**"):

$$\text{Expected}[RIO_t] = -0.0009 + 0.85Market_t + 0.58\,Industry_t$$

45. **Figure 4** adds the regression line, Equation 2, to the data plot. The regression line represents the *expected* return (given the returns on the Market and Industry indexes). The data – the *actual* returns – differ from that expectation.

Figure 4



46. I then use this model to measure the expected return for the ADR for March 7, 2012 using the actual Market Index and Industry Index returns for that day, (0.72% and 0.23%,

respectively). Applying the model yields an expected (or "predicted") return of 0.66% for the Rio Tinto ADR for March 7, 2012.[30]

47. The excess or abnormal return is calculated as the difference between the actual return and the predicted return. On March 7, 2012, the actual return for the Rio Tinto ADR was 0.76%, meaning its abnormal return that day was 0.10%.

48. Finally, I need a measure of the statistical variation of the abnormal return so that I can test whether a value of 0.10% falls within the statistically defined confidence interval, or whether it is statistically unusual. The test for whether randomness alone can account for an abnormal return of 0.10%, or whether some other factor not currently controlled for in the regression likely contributed to such a return, is based on what is known as the "t-statistic." The t-statistic is the value of the abnormal return divided by its standard deviation and represents the number of standard deviations between the actual return and the predicted return. One would expect that 95% of the time, a value drawn at random would fall within +/-1.96 standard deviations of its expected value.[31] Values further away from that become statistically unlikely if the underlying model of the data remains valid. Put differently, a t-statistic greater than 1.96 (or less than -1.96) represents empirical supporting evidence that the abnormal return observed on the event day is statistically unlikely *if the estimated market model continues to apply for the event day*.[32] Returning to the coin-flipping example, it's similar to saying that an outcome of 65

[30] The predicted return of 0.66% is found as follows: 0.85 * 0.72% (Coefficient on Market Index *times* Market Index return) + 0.58 * 0.22% (Coefficient on Industry Index *times* Industry Index return) - 0.09% (constant term from regression).

[31] This is the case when data are distributed according the Gaussian or "Normal" distribution. The cutoff point of 1.96 is known as the "critical value" for a "two-sided" test. The critical value of the t-test may be adjusted from 1.96 if there is reason to believe the abnormal returns are not Normally distributed, or if a different level of significance is sought.

[32] David I. Tabak & Frederick C. Dunbar, "Materiality and Magnitude: Event Studies in the Courtroom," *Litigation Services Handbook, The Role of the Financial Expert* (3rd ed., 2001), Chapter 19.

Heads is unlikely *if Firm A is continuing to flip a fair coin*. Instead, it becomes more likely that some other factor, outside the market model, is driving the abnormal return that day.

49. As it happens, an abnormal return of 0.10% is within the range of "typical" values; its t-statistic is just 0.08 meaning that there is no statistical evidence to suggest that anything beyond the usual random variation is affecting Rio Tinto's ADR return on March 7, 2012. In other words, the empirical evidence is consistent with the hypothesis that the estimated market model continues to apply to the data observed on March 7.

50. The event study methodology I have applied in this matter thus provides a scientific basis for having 95% confidence that the actual return will fall within 1.96 standard deviations of the predicted return unless there is some non-random explanation. Such a non-random explanation could be the influence of company-specific news revealed to the market on the event day. If on a particular day I calculate an abnormal return that has a t-statistic greater than 1.96, I could say that such a return is statistically significant[33] at the 95% confidence level. Furthermore, if I observe new and relevant firm-specific information released that day, I would reject randomness as the explanation of that abnormal return with 95% confidence and infer that the new information was likely the cause of the stock price movement.

VI. LIMITATIONS OF THE EVENT STUDY METHODOLOGY

51. Event studies are an established method for measuring and testing the impact of news on security prices, and my implementation conforms with standard academic and industry

[33] I adopt the common shorthand phrase "statistically significant" instead of the more verbose, but more precise, "statistically significantly different from 0."

practices. Finding a statistically significant abnormal return is supporting evidence that something outside the market model was influencing a security's price on a particular day.[34]

52. That said, there is a limitation to the event study approach which is worth discussing. An event study of the type described above is well-suited for measuring the net or total impact of all news released on a given day. Sometimes, however, there can be confounding news released at the same time, and this event study approach is not always well-suited for disentangling their individual effects.[35] To take a hypothetical, suppose a pharmaceutical company announces simultaneously that Drug A has passed its clinical trials and will be released to the market, while Drug B is being pulled from the market over safety concerns. It is possible that the news of Drug A is significantly positive, and the news of Drug B is significantly negative, but net-net the stock price for the company only moves a little bit. A simple event study analysis might conclude that there was no significant news that day, while in fact there were two pieces of significant news – one positive and one negative which happened to cancel each other out.

VII. MARKET REACTION TO THE RIVERSDALE ACQUISITION WAS POSITIVE

53. On April 8, 2011, after having increased its initial December 2010 bid several times, Rio Tinto gained control of Riversdale Mining.[36] According to contemporaneous news reports:

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[34] David I. Tabak & Frederick C. Dunbar, "Materiality and Magnitude: Event Studies in the Courtroom," *Litigation Services Handbook, The Role of the Financial Expert*(3rd ed., 2001), Chapter 19; A. Craig MacKinlay, "Event Studies in Economics and Finance," *Journal of Economic Literature* Vol. 35, 1997, pp. 13-39.

[35] Frederick C. Dunbar & Arun Sen "Counterfactual Keys to Causation and Damages in Shareholder Class-Action Lawsuits," *Wisconsin Law Review* Vol. 2009 (2), 2009, pp. 199-242.

[36] "Rio Looking at a A3.5bn Riversdale Bid," *Liberum Capital*, December 6, 2010; "Rio Tinto May Battle Indian Steel Majors for Riversdale Mining," *Domain-B*, December 21, 2010; "DJ Riversdale Board Accepts Rio Tinto's

> Global miner Rio Tinto won control over Riversdale Mining on Friday with a $4 billion offer, allowing the global miner to now dictate development of Riversdale's prized coal mines in Mozambique. Rio Tinto finally passed the 50 percent mark after failing over the past three months to persuade Riversdale's two key shareholders, India's Tata Steel and Brazil's CSN to sell their combined 47 percent stake.[37]

54. The price of Rio Tinto ADRs increased 2.1% that day. According to my event study analysis, this represents a positive abnormal return of 3.0%[38] with a t-statistic of 2.52, indicating that this abnormal return is statistically significant at well above the 95% confidence level. I did not find any other new information regarding Rio Tinto that day, and therefore I conclude that the abnormal return on this date was attributable to Rio Tinto's acquisition of Riversdale.

55. Analysts at Dolmen Stockbrokers reacted positively to the news:

> We view today's news of Rio Tinto's majority stake as a positive for the diversified miner as the coking coal assets which Rio has gained control of are long life, high grade and will complement its existing iron ore assets. Also the manner in which Rio gained control of Riversdale is an added bonus as it increased its stake without dissent from other large shareholders. In general the deal is a positive for the entire sector as it underlines another large commitment by the diversified miners to secure new assets that will support rising demand.[39]

56. A *Wall Street Journal* article echoed those sentiments, linking the Riversdale news to Rio Tinto's security prices, stating, "Miners [the mining sector] advanced, helped by news that

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Acquisition Proposal," *Dow Jones Chinese Financial Wire*, January 10, 2011; "UPDATE 1-Brazil's CSN Raises Stake in Takeover Target Riversdale," *Reuters News*, February 8, 2011; "UPDATE: Tata Steel Raises Riversdale Stake Amid Rio Tinto Bid," *Dow Jones International News*, March 1, 2011; "Rio Tinto Raises Bid for Riversdale, Offer Final," *Reuters News*, March 9, 2011; "Rio Tinto Says Wins 41 Percent of Riversdale Shares," *Agence France Presse*, March 30, 2011; "UPDATE: Rio Tinto Hits Riversdale Goal, Extends Offer," *Dow Jones Institutional News*, April 6, 2011.

[37] "Update 2-Rio Tinto Gains Control of Riversdale Mining," *Reuters News*, April 8, 2011, 2:28 AM ET.

[38] The Market Index and Industry Index were both slightly negative (both had returns of -0.4%), so the expected return predicted by the event study was a decline of 0.9%, in contrast to the actual 2.1% increase.

[39] "Rio Tinto – Buy," *Dolmen Daily*, April 8, 2011.

Rio Tinto had clinched a majority interest in long-pursued Riversdale Mining, boosting chances its takeover offer will be approved. Rio shares rose 3.2%."[40] Several other news reports on April 8, 2011 attributed the strong performance in Rio Tinto's ADR (and other equity securities) to the majority interest announcement.[41]

57. Although Rio Tinto began its pursuit of Riversdale as early as December 4, 2010,[42] there was no notable ADR positive price movement in response to the initial news regarding Rio Tinto's interest in the acquisition. As evidenced by news and analyst commentary and Rio Tinto's own contemporaneous public statements, there was a high degree of uncertainty that the Company would succeed in acquiring Riversdale. For instance, in December, UBS stated that Rio Tinto's initial bid was preliminary, and that Rio Tinto was "not in a position to submit a proposal for the acquisition of the Company [Riversdale]."[43] Further, analysts at J.P. Morgan surmised that there was a high probability that other players would bid for Riversdale because it was a "world-class" resource:[44]

> Having said that, a number of other companies would no doubt feel the same, implying a high likelihood of a competitive bid situation emerging in our

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[40] "Miners Drive Europe's Gains," *The Wall Street Journal Online*, April 8, 2011. Note that this article is referencing the return in Rio Tinto's stock traded in London and not the ADR, which is the reason for the difference in the return cited in the article and in the ADR data.

[41] *See*, for example, "Mining Sector Leads London Stocks Higher; ICAP Falls After Downgrade; Carnival Shares Also Drop," *MarketWatch*, April 8, 2011, 11:55 AM ET: "Meanwhile, Rio Tinto PLC rose 3.2% after the mining giant said it has acquired a majority interest in Riversdale Mining Ltd.," and "ADR Report: Shares Mostly Higher On Mining Sector Gains," *Dow Jones Newswires*, April 8, 2011, 4:41 PM ET: "Rio Tinto PLC (RIO, RIO.LN) has assumed control of Riversdale Mining Ltd. (RIV.AU), with its interest in the Africa-focused coal producer rising above 50% Friday and with the prospect of increasing it further before the takeover offer closes in less than two weeks. Shares ended up 2.1% at $73.93."

[42] "One of Rio's Small-to-Medium Transactions," *UBS*, December 6, 2010.

[43] "Rio Looking at a A$3.5bn Riversdale Bid," *Liberum Capital*, December 6, 2010; "One of Rio's Small-to-Medium Transactions," *UBS*, December 6, 2010.

[44] Note that I was unable to find evidence that another bidder actually emerged. *See*, "UPDATE 1-India's ICVL Will Not Counter Rio's Bid for Riversdale," *Reuters News*, January 27, 2011.

> view, particularly given the current tightness of the coking coal market and the highly concentrated nature of the supply side.[45]

58. Thus, even though Rio Tinto made a formal offer for Riversdale on December 4, 2010 and raised its bid on December 21, 2010, analysts explained that Rio Tinto faced obstacles to gaining control of the Riversdale mining assets.[46] Later that month, J.P. Morgan analysts continued to express doubt on Rio Tinto's ability to gain control of Riversdale, stating:

> We believe there remains the risk of an interloper: We believe that there is a risk that other bidders may emerge for Riversdale now that Rio Tinto has made a formal offer for the Group. Steelmakers Tata Steel and CSN, who together own 37.4% of RIV, may look to increase their stakes, consistent with the recent trend globally of steelmakers backwardly integrating to shore up their supply of key resources for their steelmaking needs.[47]

59. Société Générale expressed a similar sentiment:

> However, the offer price implies 4% discount to Riversdale's latest closing price: this may fuel speculation that a higher offer could be needed to seal the deal. In addition, Rio Tinto still needs to convince steelmakers Tata Steel and Brazil's CSN, which together hold around 38% of Riversdale's equity. At this stage, we cannot exclude counter bids from companies such as Tata, CSN, or China's Wuhan Iron & Steel as: 1) the Benga project is already a JV between Riversdale and Tata Steel; 2) Wisco signed a memorandum of understanding to develop Riversdale's Zambeze project earlier this year; and 3) these groups are looking to ensure security of supply and reduce their dependence on traditional miners.[48]

60. Over the following few months, Rio Tinto's acquisition of Riversdale faced resistance from competitors CSN and Tata Steel. Rio Tinto increased its bid and extended its deadline repeatedly:

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[45] "Talks with Riversdale Mining," *J.P. Morgan*, December 6, 2010.

[46] "Rio Tinto May Battle Indian Steel Majors for Riversdale Mining," *Domain-B*, December 21, 2010.

[47] "RIV Recommends RIO's A$16/share Cash Bid," *J.P. Morgan*, December 23, 2010.

[48] "Riversdale Acquisition in Line with Expectations but Probably Not a Done Deal," *Société Générale*, December 23, 2010.

- December 27, 2010: Rio Tinto effectively secured 14.9 percent of Riversdale though a signed pre-bid agreement;[49]
- January 10, 2011: Riversdale's board of directors recommended Rio Tinto's takeover proposal, through the board member from Tata Steel (a part owner of Riversdale) abstained;[50]
- January 21, 2011: the Australian Treasurer approved Rio Tinto's takeover bid for Riversdale, the last regulatory hurdle, and now Rio Tinto needed approval from Riversdale's board of directors to close the deal;[51]
- February 9, 2011: Competitor CSN raised its stake in Riversdale, likely attempting to strengthen its bargaining power in Rio Tinto's takeover bid, prompting Rio to move its takeover bid deadline from February 18 to March 4;[52]
- February 21, 2011 and March 1, 2011: Tata Steel indicated it was still interested in ownership of Riversdale and then raised its stake;[53]
- March through April, until deal completion: Rio continued to increase its offer price and extend its offer date as its competitors remained obstacles to deal completion.[54]

61. In conclusion, the following factors support a finding that the positive abnormal return on April 8, 2011 was in reaction to the news that Rio Tinto had finally succeeded in acquiring control of Riversdale: 1) analysts' assessment of Riversdale as a world-class asset desired by multiple major mining companies; 2) analysts' contemporaneous interpretation of Rio

[49] "Rio Tinto Secures 14.9% Shares of Riversdale; Signed Pre-Bid Agreement with Plural Shareholders," *Tex Energy Report*, December 27, 2010.

[50] "DJ Riversdale Board Accepts Rio Tinto's Acquisition Proposal," *Dow Jones Chinese Financial Wire*, January 10, 2011.

[51] "UPDATE: Rio Tinto Now Needs Riversdale Approval for Takeover," *Dow Jones International News*, January 21, 2011.

[52] "UPDATE 1-Brazil's CSN Raises Stake in Takeover Target Riversdale," *Reuters News*, February 8, 2011; "UPATE 1-Rio Tinto Extends Riversdale Bid as Stalemate Looms," *Reuters News*, February 9, 2011.

[53] "Tata Steel to Remain As Stakeholder In Riversdale Mining - Tata Steel MD," *Dow Jones Commodities Service*, February 21, 2011; "UPDATE: Tata Steel Raises Riversdale Stake Amid Rio Tinto Bid," *Dow Jones International News*, March 1, 2011.

[54] "Rio Tinto Raises Bid for Riversdale, Offer Final," *Reuters News*, March 9, 2011; "Rio Tinto Extends $3.9 bln Bid for Riversdale by 3 days," *Reuters News*, March 20, 2011; "Rio Tinto Creeps Up to 36 pct Stake in Takeover Target Riversdale," *Reuters News*, March 22, 2011; "Brazil's CSN: Not 'In Principle' Seeking To Sell Riversdale Coal Stake," *Dow Jones International News*, March 29, 2011; "Rio Tinto Says Wins 41 Percent of Riversdale Shares," *Agence France Presse*, March 30, 2011; "Rio Tinto Nearly Reaches 47% Holding Target in Riversdale," *Reuters News*, April 5, 2011; "UPDATE: Rio Tinto Hits Riversdale Goal, Extends Offer," *Dow Jones Institutional News*, April 6, 2011.

Tinto's earlier bids for Riversdale as inadequate to secure control; 3) analysts' expectation from December 2010 through at least March 2011 that there would be competition for the Riversdale mining assets, casting doubt on whether Rio Tinto would ultimately be successful in its efforts to acquire Riversdale; 4) publicly disclosed resistance from Tata Steel and CSN from December 2010 through as late as March 2011, further casting doubt on whether Rio Tinto would ultimately be successful; 5) contemporaneous news sources linking the positive price reaction of April 8, 2011 to the successful acquisition; and 6) the lack of other ("confounding") positive news regarding Rio Tinto on April 8, 2011 which would move the price of Rio Tinto ADRs on this date.

VIII. JANUARY 17, 2013 - THE RIVERSDALE WRITE-DOWN

62. On January 17, 2013, Rio Tinto issued a press announcement that it was (i) writing down $3 billion of its $3.7 billion acquisition of Riversdale, (ii) writing down $11 billion in its aluminum division, and (iii) that CEO Albanese was stepping down to be replaced by Sam Walsh, the head of Rio Tinto's profitable iron ore division.[55]

63. According to my event study, the abnormal return on this day was negative (a decline of 1.2%) but insignificant (a t-statistic of -1.06, which is not statistically significant at the 95% confidence level). However, this lack of statistical significance was likely due to confounding positive information released at the same time which may have countered a negative market negative reaction to the Riversdale write-off.

[55] "Rio Tinto Impairments and Management Changes," *Regulatory News Service,* January 17, 2013; "Rio: $3bn Lost in Mozambique," *Financial Times*, January 17, 2013.

A. ANALYSTS REACTED NEGATIVELY TO THE RIVERSDALE WRITE-OFF

64. On this day, the Company itself indicated that the Riversdale news was important and disappointing:

> "The Rio Tinto board fully recognizes that a write-down of this scale in relation to the relatively recent Mozambique acquisition is unacceptable," said chairman Jan du Pleissis.[56]

65. Some market analysts described the Riversdale write-down as important and surprising news and suggested that the market moved in reaction to it. For example, one equity analyst interpreted the Riversdale news as the impetus for the initial negative London stock price move:

> RIO's closing market capitalisation last night was $107.7bn and at the time of writing the share price is down c.4% or c.$4.3bn of market value lost, implying the unexpected nature of the coal impairments.[57]

66. Analysts[58] also conveyed surprise at the extent and suddenness of the write-down disclosed in the January 2013 announcement:

> - Mozambique write-down: Rio will also write down the value of its Mozambique coal assets by USD3bn. Given that RIO bought these assets for USD5bn in a hostile acquisition of Riversdale Mining in 2011,

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[56] "Rio Tinto Writes Down $14bln, CEO Resigns," *Agence France Presse*, January 17, 2013.

[57] "CEO Steps Down, but $14bn of Writedowns are Less of a Surprise - ALERT," *J.P. Morgan Cazenove*, January 17, 2013.

[58] Academic literature shows that analyst reports provide useful information to the market for price discovery. Daniel Bradley, Jonathan Clarke, Suzanne Lee, & Chayawat Ornthanalai, "Are Analysts' Recommendations Informative? Intraday Evidence on the Impact of Time Stamp Delays," *The Journal of Finance* Vol 69 (2), 2014, pp. 645-673 ("Our evidence suggests that analysts' recommendations are the most important information disclosure channel examined."); Alon Brav & Reuven Lehavy, "An Empirical Analysis of Analysts' Target Prices: Short-Term Informativeness and Long-Term Dynamics," *The Journal of Finance* Vol. 58 (5), 2003, pp. 1933-1967 ("In recent years, security analysts have been increasingly disclosing target prices in these reports, along with their stock recommendations and earnings forecasts. These target prices provide market participants with analysts' most concise and explicit statement on the magnitude of the firms' expected value."); Joseph D. Piotroski & Darren T. Roulstone, "The Influence of Analysts, Institutional Investors, and Insiders on the Incorporation of Market, Industry, and Firm-Specific Information into Stock Prices," *The Accounting Review* Vol. 79 (4), 2004, pp. 1119-1151 ("…analyst forecasting activity accelerates both the industry and firm-specific component of future earnings news."). "Corporate Performance: What Do Investors Want to Know?" *PwC*, September 2014, found at https://www.pwc.com/gx/en/audit-services/corporate-reporting/publications/investor-view/assets/pwc-investors-survey-powerful-stories-through-integrated-reporting.pdf.

> this is a more recent and arguably embarrassing correction [in contrast to Alcan]….It is unclear whether the revision to recoverable volumes was a market driven or technical revision of reserves, but in either case this is unusual.[59]
>
> - We believe the scale of the writedown raises questions about the due diligence process and was the primary driver of the need for management accountability.[60]

67. Similarly, Deutsche Bank indicated that the news did not match its assumptions regarding Rio Tinto's ability to find a workable infrastructure solution:

> While we highlighted infrastructure development as a key risk, we took the view that the company would be able [to] manage the issues. In today's announcement, the company states that this is not the case…[61]

68. And BMO was also caught off-guard:

> Additionally, the company has reported a US$3B write off relating to infrastructure and coal recovery challenges at Rio Tinto Coal Mozambique, equivalent to US$1.60/share. BMO currently values the Mozambique coal assets at US$5.3B, which may well need to be re-examined.[62]

69. Though Defendants allegedly concealed the full extent of problems at Riversdale, the market was aware that there could be logistical challenges in transporting the coal from Riversdale.[63] Some market analysts had already changed their valuation of the Riversdale mining assets prior to the write-down due to the lack of progress on these infrastructure issues,[64] but not

[59] "OW: USD14bn in Write-downs and a New CEO," *HSBC*, January 17, 2013.

[60] "CEO Change. One Impairment Too Many," *UBS*, January 17, 2013.

[61] "Capital Allocation Held to Account," *Deutsche Bank*, January 17, 2013.

[62] "Write Off of US$14B; CEO Tom Albanese Steps Down," *BMO Capital Markets*, January 17, 2013.

[63] "Zambezi Too Costly For Eurasian Coal Barges," *The Australian Financial Review,* February 10, 2012; "Mozambique Rejects Coal Barging Study," *Reuters News,* March 1, 2012.

[64] In any securities fraud matter, one can find investors who hedged against a potential loss. This does not indicate that the market knew the true circumstance. Therefore, finding that some analysts had decided to assign little value to Riversdale does not indicate that those investors or the market generally knew the true status of the Riversdale asset. Defendants had not revealed the truth until this date when they announced the write-off, and as I have documented, market participants were generally surprised and disappointed by the news.

necessarily by the full amount.[65] For instance, Société Générale had lowered its Riversdale valuation prior to January 17, 2013, but by $2 billion, not $3 billion, so they still found the news of the write-down surprising:

> By contrast [to the Aluminum write-offs], the $3bn write-off on the Mozambique assets is a relative disappointment. Rio spent more than $4bn acquiring these assets. After it reported infrastructure issues in Mozambique early last year, we started valuing these assets at 50% of the acquisition cost. Therefore, a $3bn write-off is $1bn worse than our current model. We also think the recent fall in coking coal price could be one factor exacerbating the extent of write-off.[66]

B. ANALYSTS WERE NOT SURPRISED BY THE ADDITIONAL ALCAN WRITE-DOWN

70. In addition to the Riversdale write-down, Rio Tinto wrote down approximately $11 billion in its primary aluminum asset, Alcan. In 2007, soon after Defendant Albanese became CEO of Rio Tinto, the Company acquired Alcan, a Canadian mining company and one of the world's largest aluminum manufacturers, for just over $38 billion, which was a steep premium to Alcan's share value and followed a bidding war at a time when aluminum prices were peaking.[67] However, changes in the aluminum market led to large write-offs of $687 million in 2009, $585 million in 2010, and approximately $9 billion in 2012.[68]

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[65] "Mozambique Blocks Rio Tinto Coal Barging," *Agence France Press*, March 2, 2012.

[66] "Write-offs Mostly a Non-event, New Management a Positive," *Société Générale*, January 17, 2013.

[67] "Rio Tinto to Buy Alcan for $38 Billion," *Reuters*, July 12, 2007 located at https://www.reuters.com/article/us-alcan-riotinto/rio-tinto-to-buy-alcan-for-38-billion-idUSSP1559320070712; "Rio Tinto Did Everything Wrong in a Deal that was One of the 'Worst Decisions Ever'" *Business Insider Australia*, February 15, 2013, located at https://www.businessinsider.com.au/rio-tinto-alcan-deal-writedown-2013-2.

[68] "Alcan Pain Persists," *The Australian Financial Review*, August 6, 2010; "UPDATE 3-Rio Tinto Swings to Loss After Aluminum Writeoff," *Reuters News*, February 9, 2012"; "FY2011 Earnings in Line; Dividend Increased; US$9.2B Aluminum Write-Off," *BMO Capital Markets*, February 9, 2012; "Tom Albanese Out at Rio Tinto as Alcan Bet Goes Awry," *The Globe and Mail*, January 17, 2013 located at https://www.theglobeandmail.com/globe-investor/tom-albanese-out-at-rio-tinto-as-alcan-bet-goes-awry/article7459323/

71. To many analysts, the January 2013 Alcan write-off was expected, as there was no signal that the trajectory that had led to prior write-offs was easing. Moreover, the Company had told investors back in November 2012 that they were likely to write off $5.6 billion in goodwill related to Alcan. For instance, CIMB stated:

> The potential for a writedown in the Aluminium division was flagged at the investor day in Sydney in November 2012 and is mostly related to Alcan…[69]

72. RBC added that the write-down was forewarned and not a surprise:

> Writedown expected by market: At the November investor seminar Rio had already warned of additional writedowns to be taken, with a specific focus on the Aluminium division. We had expected an additional writedown of US$5-10bn, consisting mainly of the additional goodwill of US$5.8bn associated with the Aluminium division after the 2011 writedown of the RTA and other Aluminium assets. The additional ~US$5bn of asset value writedown should not be too much of a surprise considering 1) the weak performance of the Aluminium market in 2012; and 2) that most of the miners are currently taking writedowns of larger asset purchases made over the past 5 years. We would expect the aluminium division to be carried at a value of ~$15-16bn post impairment.[70]

73. Several analysts had anticipated not just the fact of the write-down, but also its magnitude. For these analysts, the write-down brought the value of Alcan to expected levels. For instance, J.P. Morgan Cazenove stated:

> Aluminium impairment charge no[t] a surprise: we indicated in a recent note on BHP Billiton & Rio Tinto ("US$30bn of impairment charges with more to come") that we expected RIO to report more impairment charges at its FY12 results. Indeed, our NPV for the group's Aluminium division of $13bn is significantly below the last reported book value of $27bn.[71]

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[69] "Write This Down," *CIMB*, January 18, 2013.

[70] "Change of Guard," *RBC*, January 17, 2013.

[71] "CEO Steps Down, but $14bn of Writedowns Are Less of a Surprise - ALERT," *J.P. Morgan Cazenove*, January 17, 2013.

74. Other analysts expressed a similar lack of surprise, factoring in the November announcement of forthcoming write-offs, the status of the aluminum business, and the history of Alcan:

- Aluminium write-down: A write-down of USD10-11bn (post tax) is not material to our valuation. In our target price, we place a value on the aluminium assets of USD9.4bn. This is considerably less than the book value of these assets at the end of 2012 of USD26.9bn, and we had highlighted (in our report mentioned above) that RIO has flagged a potential write-down already.[72]

- Why is the $11bn write-off in aluminium a non-event? …As this business has been free cash flow negative for the last 18 months, we doubt investor assign much value to it – a view confirmed by our discussions with various market players. Therefore, the write-off is in our view simply an acceptance of what was obvious to most long ago.[73]

- Aluminium write-downs largely anticipated...: RIO will write down its aluminium assets by U$10-11bn (~US$6bn goodwill, ~US$3bn Pacific Aluminium with the rest from Alcan). Although colossal, these write-downs take the carrying value of RIO's aluminium assets to ~U$15.5bn - broadly inline with our valuation of U$15bn. As a result, this move was largely expected and perhaps removes the over-hang, putting a struggling business into some clearer air.[74]

75. Though some analysts seemed surprised by the extent of the write-off, they did not seem surprised that a write-off occurred.[75]

76. To the extent the market correctly anticipated the size of the Alcan write-off, its news on January 17 would not be expected to further impact Rio Tinto's ADR price that day. However, to the extent the market underestimated the size of the Alcan write-off, this would be considered an additional source of downward pressure on the ADR price along with the

[72] "OW: USD14bn in Write-downs and a New CEO," *HSBC*, January 17, 2013.

[73] "Write-offs Mostly a Non-event, New Management a Positive," *Société Générale*, January 17, 2013.

[74] "Acquisition Accountability," *Macquarie*, January 18, 2013.

[75] "Write This Down," *CIMB*, January 18, 2013; "Capital Allocation Held to Account," *Deutsche Bank*, January 17, 2013; "Enter Sam Walsh," *Nomura*, January 17, 2013.

Riversdale write-off. Based on analysts' reactions however, the Riversdale write-down was the bigger surprise and greater disappointment, even if the amount of the write-down was smaller. Regardless, Riversdale was a major part of the story, as evidenced by the Company's statement that lead with Riversdale before Alcan:

> "The Rio Tinto board fully acknowledges that a writedown of this scale in relation to the relatively recent Mozambique acquisition is unacceptable," chairman Jan du Plessis said in a statement. "We are also deeply disappointed to have to take a further substantial writedown in our aluminum businesses, albeit in an industry that continues to experience significant adverse changes globally."[76]

C. ANALYSTS REACTED POSITIVELY TO THE CHANGE IN COMPANY LEADERSHIP

77. The write-downs led CEO Albanese to resign:

> Anglo-Australian mining giant Rio Tinto Thursday announced a $14 billion write-down on its Mozambique coal assets and ailing aluminium business, prompting its chief executive to resign.[77]

78. A review of analyst reaction regarding the departure of CEO Albanese and the appointment of Sam Walsh indicates that the change was unexpected and overwhelmingly positive.[78] For instance, J.P. Morgan stated:

> **In a major surprise this morning, RIO has announced CEO Tom Albanese is stepping down**, plus it will take write downs of US$10-11bn in Aluminium and US$3bn in Mozambique Coal (acquired in 2011 for $3.5bn) at FY'12 results. **We believe the appointment of Sam Walsh, a long standing steward of iron ore, may point to a more conservative approach**

[76] "Tom Albanese Out at Rio Tinto as Alcan Bet Goes Awry," *The Globe and Mail*, January 17, 2013 located at https://www.theglobeandmail.com/globe-investor/tom-albanese-out-at-rio-tinto-as-alcan-bet-goes-awry/article7459323/

[77] "Rio Tinto Writes Down $14bln, CEO Resigns," *Agence France Presse*, January 17, 2013.

[78] I did not find any analyst reports that expressed disappointment that Defendant Albanese was terminated, nor any that speculated that Sam Walsh would be harmful to the Company going forward.

> **to M&A and cost discipline, both of which we expect will be welcomed by shareholders.**[79]

79. One article stated that the removal of CEO Albanese and replacement with Sam Walsh was responsible for keeping the London security from a more drastic price decline:

> Rio Tinto's share price bounced back to be down less than 2% in London in mid-morning, signaling that investors are encouraged that the Anglo-Australian miner is taking bold steps to shake-up the business…[80]

80. The academic literature on CEO turnover indicates that management changes provide the market with new information which can be associated with statistically significant abnormal price changes.[81] For instance, looking at the two-day abnormal return for larger firms replacing top management with internal candidates (as happened here with Rio Tinto), Furtado and Rozeff find an average positive and statistically significant abnormal return of 0.51 percent (at the 5% level).[82] Huson et al. analyzed 1,302 CEO turnover events and found the average abnormal return was 0.344% (also statistically significant at the 1% level), while Bonnier and Bruner found an average positive abnormal return of 0.913% on the event date.[83]

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[79] "CEO Steps Down, but $14bn of Writedowns are Less of a Surprise - ALERT," *J.P. Morgan Cazenove*, January 17, 2013.

[80] "WSJ BLOG/Deal Journal: Analysts React to Rio Tinto Management Reshuffle, Writedown," *Dow Jones News Service*, January 17, 2013.

[81] Mark R. Huson, Paul H. Malatesta, & Robert Parrino, "Managerial Succession and Firm Performance," *Journal of Financial Economics* Vol. 74, 2004, pp. 237-275; Matthew C. Clayton, Jay C. Hartzell, & Joshua Rosenberg, "The Impact of CEO Turnover on Equity Volatility," *The Journal of Business* Vol. 78 (5), 2005, pp. 1779-1808; Karl-Adam Bonnier & Robert F. Bruner, "An Analysis of Stock Price Reaction to Management Change in Distressed Firms," *Journal of Accounting and Economics* Vol. 11, 1989, pp. 95-106; Stewart D. Friedman & Harbir Singh, "CEO Succession and Stockholder Reaction: The Influence of Organizational Context and Event Content," *The Academy of Management Journal* Vol. 32 (4), 1989, pp. 718-744.

[82] Eugene P.H. Furtado & Michael S. Rozeff, "The Wealth Effects of Company Initiated Management Changes," *Journal of Financial Economics* Vol. 18, 1987, pp. 147-160.

[83] Mark R. Huson, Paul H. Malatesta, & Robert Parrino, "Managerial Succession and Firm Performance," *Journal of Financial Economics* Vol. 74, 2004, pp. 237-275; Karl-Adam Bonnier and Robert F. Bruner, "An Analysis of Stock Price Reaction to Management Change in Distressed Firms," *Journal of Accounting and Economics* Vol. 11, 1989, pp. 95-106.

81. Further, CEO turnover involves two separate events, the exit (whether voluntary or involuntary) by the incumbent CEO and the hiring of a replacement. The removal of poorly performing management may be considered positive because the market hopes that poor management strategy will stop; this may be reinforced by the hiring of a new leader which tells the market how much of a change in direction can be expected, if the status quo will be upheld, or if the market needs to wait and see what strategy develops.

82. According to Worrell et al.:

> ….**abnormal stock returns occurring when key manager changes are announced are the sum of two components** (Bonnier & Bruner, 1989; Warner et al., 1988). One is an "information component" that is neutral if the firing announcement conveys no new information regarding managerial performance. The second is a "real component" that is positive if investors perceive the key executive replacement announcement to be in the shareholders' interest…
>
> Announcements of permanent successors replacing fired predecessors associated with poor performance may be seen as adaptive responses suggesting strategic redirection. Mizruchi (1983) argued that boards exercise "bottom-line control" by ousting CEOs when firm performance fails to meet board expectations and that, by positioning new key executives at the helm, boards may signal the end of entrenched management (Demsetz, 1983).[84]

83. Similarly, Clayton et al. state:

> The wealth effect associated with an announced change in CEO can be decomposed into an information effect (the firm's prospects are worse than previously believed) and a real effect (the new CEO is expected to improve future firm performance).[85]

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[84] Dan L. Worrell, Wallace N. Davidson III, & John L. Glascock, "Stockholder Reactions to Departures and Appointments of Key Executives Attributable to Firings," *The Academy of Management Journal* Vol. 36 (2), 1993, pp. 387-401.

[85] Matthew C. Clayton, Jay C. Hartzell, & Joshua Rosenberg, "The Impact of CEO Turnover on Equity Volatility," *The Journal of Business* Vol. 78 (5), 2005, pp. 1779-1808

84. Other analysts echoed the J.P. Morgan commentary, indicating that both components were present. That is, the market was reacting positively to both the removal of the old guard and the hiring of someone with a new perspective:

- Rio also announced that Tom Albanese, CEO since 2007, has stepped down by mutual consent with the board and will be replaced by Iron Ore chief executive Sam Walsh. This coincides with the massive impairment charges announced on the recent Alcan and Riversdale acquisitions, which occurred during Albanese's watch. Group executive Doug Ritchie, who led the acquisition and integration of the Mozambique coal assets, has also stepped down. **Notably, the departure of both Albanese and Ritchie combined with the retirement of CFO Guy Elliott, who will step down from his post at the end of 2013, marks a changing of the guard at Rio….In our view, Walsh is a highly credible successor and is well-regarded across the industry.**[86]

- **Departure of CEO a positive**: Rio Tinto delivered a good operating performance under Tom Albanese but at the same time made several poor acquisitions during his period as CEO. Today's write-off clearly indicates it paid too much for Alcan, and we are not yet convinced about the merits or the strategy of the Hathor deal. Unforeseen circumstances (infrastructure issues, collapse of coking coal price) may have affected the Mozambique deal adversely but that does not change the fact that Rio has never released in-depth data on the projects; lack of detail has prevented us from fully modelling the deal and coming up with more than a 'make do' NPV estimate for the projects….**Sam Walsh looks like a good choice: We think Sam Walsh, currently CEO of the iron ore business, is a good pick for the group CEO job, not least as iron ore accounts for 75% of Rio Tinto's EBITDA. This suggests a 'back to basics' move and a shift away from what has proved to be a poor M&A-driven growth strategy.**[87]

- There is a significant correlation between being too acquisitive and poor shareholder returns (Rio's experience with Alcan/Riversdale, BHP's with shale assets and Anglo's with Minas Rio are all good examples of deals gone bad). **As Tom Albanese is being replaced because of value destructive M&A deals, we think his successor Sam Walsh is likely to learn from Tom's experience and is unlikely to repeat these**

[86] "Changing of the Guard," *Jefferies*, January 17, 2013.

[87] "Write-offs Mostly a Non-event, New Management a Positive," *Société Générale*, January 17, 2013.

mistakes. This is a significant positive for Rio Tinto's long-term stock price outlook.[88]

- The frank release also announced that Tom Albanese and Doug Ritchie would be stepping down effective immediately, would not be taking 2012 or 2013 bonuses and would be forfeiting outstanding deferred bonuses. **The Board message to management is clear. "Do not ask for investment capital unless you can deliver returns." …Somewhat long-awaited, this heralds the potential for a further improvement in capital allocation….A change in capital allocation strategy is a key catalyst**…Today's rapid Board response to a second misallocation of capital (Riversdale after Alcan) is the first step in this change in our view with very clear message that capital spending will be subject to increased scrutiny (the next step will be returning the unspent capital to shareholders). **Sam Walsh is a good CEO replacement in our view**; he is already on the board, and accountable for the largest part of Rio's earnings and growth. **We expect him to deliver a series of positive announcements in coming months**…[89]

- We believe the appointment of Sam Walsh should prove positive for shareholders on expectation of a focus on core activities, greater capital discipline and higher shareholder returns….Alcan acquisition claims Chairman, CEO, and CFO – management revitalization positive. RIO's 2007 Alcan acquisition has now led to the departure of the management team responsible for the transaction, with CEO Tom Albanese leaving today (effective immediately). He's replaced by current Iron Ore Chief Sam Walsh, who is 63yrs old, and has been with the company since 1991. We view Sam's appointment as positive for the shares; on the basis it now removes all senior executives responsible for the failed Alcan transaction, which has been an overhang since the deal was completed in 2007. This revitalization of management may encourage some investors back into the stock who exited following dissatisfaction with the deal. We also view Sam as extremely capable of running the Group, given he already controls RIO's largest division (c. 75% of FY13E NPAT)…Capital discipline likely to be a key focus – Buy RIO, especially on any weakness….Further, new management are likely to have an acute focus on capital discipline, and be much more conservative on M&A. We view this likely improvement in strategy as positive for shareholders… Iron Ore Chief Sam Walsh announced as CEO. Walsh's appointment reflects RIO's Iron Ore's significance (c.75% of FY13E NPAT). In our view this appointment is positive, likely to lead to greater capital discipline. Walsh already runs ¾ of the

[88] "Why New CEO is Likely to be a Positive for Rio Tinto Shares," *Société Générale*, January 18, 2013.

[89] "Capital Allocation Held to Account," *Deutsche Bank*, January 17, 2013.

RIO business, so no major changes from an operational point of view are likely.[90]

- Sam Walsh is the logical replacement for Albanese and has a strong operational heritage and may be more focussed on iron ore growth, which the market will like.[91]

- Sam Walsh is known to the market, having such a prominent position within RIO, and we view him as a very safe pair of hands. It's a little surprising to see both CEO and CFO change in the same year (CFO Guy Elliot has previously flagged he will retire during 2013), although RIO has significant bench strength and good succession planning.[92]

- Sam Walsh has led RIO's Iron Ore division during a significant expansion phase, importantly without capex blowouts - this is a welcome change in leadership, in our view….In our view, Sam Walsh - New RIO CEO, and the current head of the Iron Ore division - is viewed well by the market as he has managed a successful business particularly during the expansion phase, importantly with no capex blowouts. The change in leadership may be a mild positive as it removes a slight overhang on the stock given ongoing question marks particularly over the Alcan acquisition.[93]

- These write-downs relate to the two largest acquisitions the company has made during Tom Albanese's tenure, and in our view, his position had become untenable… Sam Walsh (the new CEO with immediate effect) is well known to the market, has been with the Group since 1991, has been in charge of RIO's iron ore business since 2004, and has been on the Board since 2009…[We] would be surprised to see RIO involved in any M&A activity in the near term.[94]

- In addition, the action of the board in selecting a new management team sends a strong signal that management at all levels of the group needs to husband capital.[95]

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[90] "Alcan Overhang Gone with CEO Departure & $14bn Impairment Charge," *J.P. Morgan Cazenove*, January 17, 2013.

[91] "Big Write Downs and Management Changes, RIO Moving Ahead of Market Expectations on Both Counts," *Liberum Capital*, January 17, 2013.

[92] "OW: USD14bn in Write-downs and a New CEO," *HSBC*, January 17, 2013.

[93] "Write This Down," *CIMB*, January 18, 2013.

[94] "Enter Sam Walsh," *Nomura*, January 17, 2013.

[95] "Rio Remains Our Top Pick on Higher Prices," *Canaccord Genuity*, January 29, 2013.

85. As documented above, both the firing of CEO Albanese and the hiring of Sam Walsh were considered positive developments. Thus, consistent with academic research, these positive surprises regarding the change in leadership should be associated with upward pressure on the ADR price. For instance, Huson et al. state:

> Like Bonnier and Bruner (1989) and Weisbach (1988), we find also that **statistically significantly positive average abnormal stock returns coincide with management turnover announcements**. Moreover, we show that turnover announcement abnormal stock returns are significantly positively related to subsequent changes in operating performance measured using accounting numbers. **This suggests that investors view turnover announcements as good news because they expect that turnover will prompt performance improvements, on average**.[96]

86. Therefore, given the upward pressure from the positive reaction to management turnover, that the negative abnormal return measured on January 17, 2013 was not statistically significant may be explained by the competing news released that day. The write-down of the Riversdale asset, by itself, could well have put significant negative pressure on the ADR price, while the change in Company leadership, by itself, could well have put significant positive pressure on the ADR price. The write-down of Alcan likely did not significantly impact the ADR price, though it may have also contributed marginal negative pressure on the ADR.

IX. THE BOND MARKET

87. This section is intended to provide a brief introduction and overview of corporate bonds, their pricing and their market structure. I do not attempt to outline a complete description of all aspects of bonds or bond pricing theory (which is the subject of entire textbooks and additional literature), but simply a summary of the basic or "plain vanilla" corporate bond

[96] Mark R. Huson, Paul H. Malatesta, & Robert Parrino, "Managerial Succession and Firm Performance," *Journal of Financial Economics* Vol. 74, 2004, pp. 237-275.

market. This section should provide a basic explanation of how the market perception of a company's risk can impact its cost of debt financing.

88. During the period of interest, December 1, 2010 to January 17, 2013, Rio Tinto issued eleven corporate bonds, all of which were listed on the NYSE.[97] **Exhibit 1** lists the details of those issuances.

A. OVERVIEW OF BONDS AND BOND PRICES

89. When a company wants to raise capital, it may sell equity shares or issue debt instruments. A debt instrument is essentially an "IOU," and represents a contract from the company to pay a certain amount on a certain date, often with interest.[98] Equity is an ownership position in the company and gives the holder a claim on the residual value of the company's assets over and above its debt obligations. The interests of the debt holder come before those of the equity holder, but while the payments to the debt holder are generally bounded or fixed by contract, the value of the equity position can, potentially, increase substantially.[99] The decision to invest in a company's debt can therefore be based on different considerations from the decision to invest in its equity.

[97] *See* Rio Tinto Finance (USA) Limited Prospectus Supplement Filed Pursuant to Rule 424(b)(5), Registration No. 333-151839, filed May 19, 2011; Rio Tinto Finance (USA) Limited Prospectus Supplement Filed Pursuant to Rule 424(b)(5), Registration No. 333-175037, filed September 15, 2011; Rio Tinto Finance (USA) plc Prospectus Supplement Filed pursuant to Rule 424(b)(5), Registration No. 333-175037, filed March 20, 2012 (the "March Prospectus"), and Rio Tinto Finance (USA) plc Prospectus Supplement Filed pursuant to Rule 424(b)(5), Registration No. 333-175037, filed August 17, 2012 (the "August Prospectus"). Seven of these bonds were mentioned directly in the Complaint at ¶¶ 107-112, 145.

[98] Debt instruments are sometimes labeled "bonds" and sometimes labeled "notes." This convention is based on the maturity of the instrument but does not represent an important economic difference. In this section I will use "bond" to refer to any debt instrument, regardless of its maturity.

[99] While the "debt" versus "equity" dichotomy described here is common, it is also a bit simplistic. Many financial instruments have both "debt-like" and "equity-like" features and can be difficult to characterize as strictly one type or the other.

90. Corporate bonds are forms of debt in which the company makes interest payments in addition to paying the bond's face value at the maturity date. For example, each 7.25% Rio Tinto Bond issued on October 28, 1998 had a par value of $1,000. This means that at maturity (November 1, 2028) the bondholder is scheduled to receive a payment of $1,000. Furthermore, the bondholder is entitled to receive interest payments of 7.25% per year (7.25% multiplied by $1000 face value, equal to $72.50 per year), paid in semi-annual installments of $36.25 every six months. This type of semi-annual, fixed interest bond is very common, though a wide variety of alternatives exist in the market.

91. Bondholders do not own equity in the company, unlike shareholders, but are contractually obligated to receive payments and maintain legal priority over equity holders in the case of a company's bankruptcy. Additionally, unlike common stock, which has unlimited upside, a corporate bond's fair value is limited by the defined (and often fixed) nature of its cash flows, regardless of how well the underlying company performs. Therefore, even if a company performs extremely well and its stock price doubles, its corporate bonds will never pay more than their contractually specified amounts, and (all else constant) the fair value of the bonds would not be expected to rise substantially.

92. The price of a bond is sensitive to the credit risk of the company (i.e., the risk of non-payment or partial payment) and to what economists refer to as the "risk premium." For this reason, the price of a bond, which can be understood as the present value of its future expected cashflows, will be influenced by the market yield on comparable securities and firm-specific credit risk (i.e., the probability of default and the expected recovery in case of default).[100]

[100] Richard A. Brealey, Stewart C. Myers, & Franklin Allen, *Principles of Corporate Finance* (10th ed., 2011), McGraw Hill, Chapter 3.

93. For an issuer with *de minimis* credit risk, the price of its bonds will be dominated by changes to the risk premium, and almost unaffected by changes (particularly positive changes) to the issuer's fundamental financial strength. If the market already perceives a zero probability of default for the issuer, it would not matter from that point if the issuer's fundamentals improved further. Yet the prices of (effectively) zero-default risk bonds do change. As just one example, consider the ever-fluctuating yields on U.S. government securities. As a general statement, historically there have been periods of no or essentially no risk of default, yet prices sometimes rose, and sometimes fell.

B. BRINGING BONDS TO MARKET: THE PRIMARY BOND MARKET

94. Multiple parties are involved in the issuance of a bond. The primary participant (besides of course the issuer itself) is the underwriter, or underwriting syndicate, of the bond. The issuing company will retain an underwriter, most frequently an investment bank, which provides multiple services to the issuer such as insurance for unsold securities and assistance in documenting, marketing, pricing, and selling the security.[101] If the bond issue is large, the main underwriters may form a syndicate, inviting other investment firms into the deal to help market the bond.[102]

95. When issuing a new bond in the US market, a firm files documents with the SEC. For example, Rio Tinto issued a prospectus supplement for the four bonds issued on March 22, 2012,[103] and another for the three bonds issued on August 21, 2012 (together, the

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[101] Ayako Yasuda, "Do Bank Relationships Affect the Firm's Underwriter Choice in the Corporate-Bond Underwriting Market?" *The Journal of Finance* Vol. 60 (3), 2005, pp. 1259-1292.

[102] "Corporate Operational Underwriting Process," The Bond Market Association & The Depositary Trust & Clearing Corporation, December 9, 2004, found at http://www.levow.com/wp-content/uploads/SG/-%20Debt%20Capital%20Markets/Corporate%20Bond%20Underwriting%20Process.pdf.

[103] March Prospectus.

"Prospectuses").[104] These provided complete details of the offering, including the par value, issue date, maturity date and coupon for each bond, a discussion of risk factors facing the Company, and historical financial data, incorporating prior SEC filings. For instance, the March Prospectus states:

> The summary consolidated historical financial data should be read in conjunction with, and are qualified in their entirety by reference to, the audited consolidated financial statements and notes thereto contained in the Annual Report on Form 20-F of Rio Tinto plc and Rio Tinto Limited for the year ended December 31, 2011, which is incorporated by reference in this prospectus supplement.[105, 106]

96. The Prospectuses also contain sections regarding the Underwriting. For instance, the March Prospectus listed Citigroup, Credit Suisse, Deutsche Bank, and J.P. Morgan as the main underwriters representing a larger set of underwriters, and HSBC, Morgan Stanley, and RBS as main underwriters for the bonds in the August Prospectus.[107]

97. There are generally two types of issuance for new bonds. In some cases, the underwriters purchase the entire issue from the issuer at a predetermined price and then assume all the risk of marketing and placing the bonds thereafter. In other cases, investors submit bids prior to the issuance, rather like an auction.[108] In either case, this initial round represents the source of all proceeds raised by the issuer for its bonds.

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[104] August Prospectus.

[105] March Prospectus, p. S-14.

[106] The Complaint (¶¶ 112, 147-48) alleges that the Prospectuses and the incorporated Form 20-F contained allegedly false and misleading statements.

[107] March Prospectus, p. S-21 and August Prospectus, p. S-21.

[108] Kenneth D. Garbade & Jeffrey F. Ingber, "The Treasury Auction Process: Objectives, Structure, and Recent Adaptations," *Federal Reserve Bank of New York: Current Issues in Economics and Finance* Vol. 11 (2), 2005.

C. THE ROLE OF RATING AGENCIES: RISK AND THE COST OF FINANCING

98. Credit rating agencies also play a critical role in the process of bringing a bond to market. Before going to market, many issuers (particularly larger issuers) will engage one or more of the major bond credit rating agencies such as Moody's, S&P, or Fitch to assign a credit rating to its bonds. These ratings represent the opinions of the rating agency on the relative riskiness of the bonds. The ratings themselves are familiar symbols such as Aaa (or AAA), Aa1 (or AA+), and so on, with the different agencies using similar but not always identical symbols.

99. Issuers obtain credit ratings because this can potentially lower the issuer's cost of financing. If a major rating agency expresses its opinion that the issuer's debt is relatively "safe," investors will often be willing to lend to that issuer on more favorable terms. Even obtaining an opinion that the debt is relatively "risky" may lead to lower financing costs than having no opinion at all.[109]

100. Investors will be willing to lend money to less risky issuers at lower coupon rates. For example, for a hypothetical bond maturing in one year, if investors believe that the issuer is almost surely going to repay the loan in full, the investor may only require a moderate return, say perhaps 3%. For such a bond, that would mean the investor would be willing to lend the issuer $100 today in exchange for a promise of receiving $103 one year from now because the investor is highly confident that the promise will be kept. However, if investors believe that the issuer may *not* repay the loan in full, they would only be willing to lend the issuer $100 today in exchange for a promise to receive *more* than 3% one year from now. If the investors think there is a 10% chance the issuer will not pay at all, and a 90% chance the issuer will pay in full, then

[109] The opinion of the rating agencies is influential but not determinative of pricing. Investors may form their own opinions on credit risk. In addition, tax, currency, and liquidity issues can affect prices. A more subtle pricing consideration is how the credit risk of the issuer correlates with broader market risk.

the investor may require a coupon rate of 14.44%, for example, instead of 3%. With that coupon rate, the investor is lending $100 today against an *expected* payment of $103 one year from now. In this very simple view of the world, investors are indifferent between investing in the 3% coupon bond with the certain payoff or investing in the 14.44% coupon bond with the uncertain payoff, because both provide the same expected payment of $103.[110]

101. While it is natural to think of risk as affecting the required coupon rate the issuer must promise, we can equivalently think of risk as affecting the *price* at which the issuer can sell its bonds. For example, if safe Issuer A offers a 3% annual bond due in one year, investors might be willing to pay $100 for that bond. At that price, investors expect to receive a 3% return on their investment. At the same time, if risky Issuer B also offers a 3% annual bond due in one year, investors would generally be willing to pay less than $100 for that bond. Keeping with the same simple view of the world, this risky bond has an expected payoff of $92.70. If investors paid $90 for this bond, their expected return would again be 3%. We could say that investors would be indifferent between paying $100 to obtain a certain $103 payoff one year from now (thus obtaining a 3% return on investment) or paying $90 to obtain an expected $92.70 payoff one year from now (and again obtaining a 3% return on investment).

102. Continuing this example, suppose that risky Issuer B needs to raise $100,000,000 today to finance a new project. It has a choice on how to proceed. On the one hand, it can maintain its 3% coupon rate, but then raise only $90 for every $100 notional of bonds it tries to place into the market. To raise the necessary $100,000,000, it would have to issue $111,111,111

[110] This is intended as a simple illustration of basic principles. There may be many reasons why risk averse investors would not be indifferent between these alternatives.

of 3% coupon bonds.[111] If Issuer B follows this option, it is raising $100,000,000 today against a promise of paying $114,444,444 one year from now.

103. On the other hand, Issuer B could instead increase its coupon rate to 14.44%. Now, it only needs to issue $100,000,000 of 14.44% coupon bonds in order to raise the necessary funds. If Issuer B follows this option, it is again raising $100,000,000 today against a promise of paying $114,440,000 one year from now. With allowances for rounding, it is clear that the two options are identical from Issuer B's point of view.

104. The essential point is that market perceptions of risk impact a company's cost of issuing debt. The company may respond by increasing the coupon rate on its debt, or by issuing more debt at a lower price, or some combination of the two.

105. The major credit rating agencies use 21 difference symbols in their ratings scales. Each "notch" in that scale is valuable to an issuer, meaning the typical cost of financing for an A3 rated issuer is lower than the typical cost of financing for a Baa1 rated issuer, to use Moody's rating symbols.

106. Rio Tinto issued $5.5 billion of par value through seven bond offerings in 2012. Those bonds were rated A3 by Moody's Investors Service at the time of their issuance. Using data from Moody's on representative pricing for the different rating categories on the issuance days in 2012, I show in **Table 1** how the price of those bond offerings might have changed had the bonds been rated one notch higher (A2) or one notch lower (Baa1). The cost of the debt would be expected to be about 3% more or less expensive under those hypothetical

[111] Recall that investors will pay $90 for every $100 par amount of the bonds. Hence selling $111,111,111 par amount at a price of $90 would raise $100,000,000 in proceeds.

alternatives.[112] In this illustration I assume that Rio Tinto maintained the same coupon rates on its debt instruments and allowed prices to change; equivalently Rio Tinto might adjust its coupon rates to preserve prices.

Table 1

							Hypothetical at A2		Hypothetical at Baa1	
CUSIP	**Par Value ($)**	**Issue Date**	**Maturity Date**	**Coupon**	**Issue Price ($)**	**Issue Value ($)**	**Price ($)[A]**	**Change in Value ($)[C]**	**Price ($)[B]**	**Change in Value ($)[C]**
76720AAA4	500,000,000	3/22/2012	3/20/2015	1.125%	99.7160	498,580,000	100.1257	2,048,424	99.1979	(2,590,404)
76720AAB2	500,000,000	3/22/2012	3/22/2017	2.000%	99.8720	499,360,000	100.7842	4,560,857	98.7256	(5,731,896)
76720AAC0	1,000,000,000	3/22/2012	3/22/2022	3.500%	99.4740	994,740,000	101.8741	24,001,480	96.5169	(29,570,924)
76720AAD8	500,000,000	3/22/2012	3/22/2042	4.750%	98.5990	492,995,000	104.0639	27,324,703	92.2477	(31,756,321)
76720AAE6	1,250,000,000	8/21/2012	8/21/2017	1.625%	99.4520	1,243,150,000	100.4998	13,097,792	98.1055	(16,831,280)
76720AAF3	1,000,000,000	8/21/2012	8/21/2022	2.875%	98.6880	986,880,000	101.2360	25,480,298	95.4785	(32,094,910)
76720AAG1	750,000,000	8/21/2012	8/21/2042	4.125%	97.3460	730,095,000	103.2160	44,025,322	90.3965	(52,121,120)
	$ 5,500,000,000					***$ 5,445,800,000***		***$ 140,538,877***		***$ (170,696,856)***

[A] *Price found to equate the hypothetical spread at an A2 rating. The hypothetical A2 spread is found by scaling the actual spread for the CUSIP by the multiple of A2 spreads to A3 spreads as calculated by Moody's Investors Service. The multiple on 3/22/2012 was 0.79; the multiple on 8/21/2017 was 0.77.*

[B] *Price found to equate the hypothetical spread at a Baa1 rating. The hypothetical Baa1 spread is found by scaling the actual spread for the CUSIP by the multiple of Baa1 spreads to A3 spreads as calculated by Moody's Investors Service. The multiple on 3/22/2012 was 1.27; the multiple on 8/21/2017 was 1.30.*

[C] *Change in value is found by multiplying the par value by the change in price per $100.*

D. TRADING BONDS: THE SECONDARY BOND MARKET

107. The initial investors who purchase the bonds may choose to sell them to other investors. Subsequent trades of bonds take place in what is called the secondary market, predominantly among large institutions such as pension funds and mutual funds.[113]

108. Currently the corporate bond market is much smaller than the stock market, and by many measures it is less liquid than the stock market. The total market value of outstanding

[112] This analysis is intended as a hypothetical illustration of the typical or representative differences in pricing between differently rated bonds. This example uses representative pricing points provided by Moody's Investors Service for the indicated days of issuance. This example is not meant to suggest that all Baa1-rated bonds (or A2-rated bonds) are priced identically; there is always a range of pricing within a rating category at a given point in time. Nor is this example meant to suggest that these are the prices which would most likely have been obtained if Rio Tinto's bonds were rated Baa1 (or A2).

[113] Hendrik Bessembinder & William Maxwell, "Markets: Transparency and the Corporate Bond Market," *The Journal of Economic Perspectives* Vol. 22 (2), 2008, pp. 217-234.

corporate bonds in the United States at the end of 2014 was approximately $8.04 trillion compared to $19.35 trillion in total equity market cap in the NYSE, for example.[114] The value and frequency of trades in the corporate bond market from 2010 to 2014 is shown in the **Table 2** below (units in billions):

Table 2

	2010	2011	2012	2013	2014
Average Daily Trading Volume[A]	$20.5	$20.6	$22.6	$24.7	$26.7
Outstanding Corporate Bonds[B]	$6,730.1	$6,843.6	$7,252.1	$7,678.6	$8,044.4
Average Weekly Turnover[C]	1.52%	1.51%	1.56%	1.61%	1.66%
Annual Turnover Velocity[D]	76.58%	76.04%	78.59%	81.05%	83.60%

[A] *SIFMA, "Statistics: US Corporate Bond Trading Volume," available at http://www.sifma.org/research/statistics.aspx.*

[B] *SIFMA, "Statistics: US Bond Market Issuance and Outstanding," available at http://www.sifma.org/research/statistics.aspx.*

[C] *Average weekly turnover = (Average daily trading volume x 5 trading days)/Outstanding Corporate Bonds.*

[D] *There are usually 252 trading days in a year. Annualized Turnover Velocity = (Average Daily Trading Volume x 252) / Outstanding Corporate Bonds.*

109. The table above shows that average weekly turnover for bonds from 2010-2014 varied from 1.51% to 1.66% with an average of 1.57% annually. This compares to 2.79% for stocks.[115] Thus, during this period, corporate bonds on average traded less frequently than stocks.

110. An important difference between the stock market and the corporate bond market is that while stocks often trade on an exchange, corporate bonds trade primarily over the counter

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[114] SIFMA, "Statistics: US Bond Market Issuance and Outstanding," available at http://www.sifma.org/research/statistics.aspx; World Federation of Exchanges, "Equity Market Highlights" available at https://statistics.world-exchanges.org/PredefinedReport.

[115] From 2010 to 2014, the average weekly turnover ratios were 2.13% for NYSE and 4.92% for NASDAQ. See, World Federation of Exchanges, "Report Generator," available at https://www.world-exchanges.org/our-work/statistics.

("OTC").[116] An over the counter market is one in which brokers/dealers maintain a market by expressing willingness to buy/sell at quoted bid/ask prices. Traditionally, OTC trades were conducted over the phone from broker-dealer trading desks where individual buy and sell negotiations were executed through the bid and ask prices. More recently, OTC trading has also incorporated electronic trading platforms that automatically match buy and sell orders.[117]

111. In the past, pricing information for bonds was difficult to obtain, as OTC trades were mostly conducted over the phone from broker-dealer trading desks and there was no mechanism for centralized reporting. However, with regulations that require trade reporting and the increased use of electronic trading platforms, dissemination of pricing information for bonds has increased dramatically. This has made the bond market more transparent.

112. For example, in 1994, the National Association of Securities Dealers[118] (NASD) commenced the Fixed Income Pricing System (FIPS) which was a mandated regulatory reporting system for certain high yield corporate debt instruments. FIPS was started with the objective of establishing a centralized regulatory mechanism for bond trade reporting.[119] In 2001, to further increase price transparency in the corporate debt market, the NASD established the Trade Reporting and Compliance Engine (TRACE). With the implementation of TRACE, all NASD and FINRA[120] members are required to report prices, quantities and all relevant information for

[116] I note that Rio Tinto bonds did trade on the New York Stock Exchange during the period of interest.

[117] U.S. Department of the Treasury, "Electronic Trading in the Secondary Fixed Income Markets," p. 10.

[118] NASD was founded in 1939 in the wake of the 1938 Maloney Act amendments to the Securities Exchange Act of 1934. Refer to A.R.W, "The NASD – An Unique Experiment in Cooperative Regulation," *Virginia Law Review* Vol. 46 (8), 1960, pp. 1586-1600.

[119] Edith S. Hotchkiss & Tavy Ronen, "The Informational Efficiency of the Corporate Bond Market: An Intraday Analysis," *The Review of Financial Studies* Vol. 15 (5), 2002, pp. 1325-1354.

[120] Financial Industry Regulatory Authority (FINRA) is a non-governmental organization authorized by Congress to regulate the securities industry and protect investors. (See also http://www.finra.org/.)

transactions in corporate bonds covered by TRACE.[121] By 2006, there were 34,251 corporate bonds included in the TRACE system with trade reporting within 15 minutes of execution. Today, in addition to TRACE, the greater use of electronic trading platforms such as MarketAxess,[122] BGC Partners,[123] GFI Group,[124] and Tradeweb,[125] provides additional real-time corporate bond price information.

X. CONCLUSIONS

113. As discussed in this report, I have applied an event study methodology to analyze the market's reaction to Rio Tinto's acquisition of the Riversdale mining assets on April 8, 2011. I find a statistically significant positive abnormal return associated with the acquisition on this date.

114. Using the same methodology, I find that the market reacted negatively, but not significantly, to the Riversdale write-down and other news announced on January 17, 2013. This is not unexpected since the market learned of a change in senior management of the Company at the same time it learned of the write-down.

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[121] https://www.finra.org/sites/default/files/TRACE_Overview.pdf; and Edith S. Hotchkiss & Tavy Ronen, "The Informational Efficiency of the Corporate Bond Market: An Intraday Analysis," *The Review of Financial Studies* Vol.15 (5), 2002, pp. 1325-1354.

[122] MarketAxess was formed in April 2000 by combining the efforts of Bear Stearns & Co. Inc., The Chase Manhattan Corp and J.P. Morgan & Co to offer fully-disclosed electronic trading in U.S. high-grade Corporate Bonds, Eurobonds, Emerging Market bonds, high yield/crossover, credit default swaps (CDS) and U.S. agency securities.

[123] BGC was established in 1945 under the assumed name of Cantor Fitzgerald. In August 2004, Cantor Fitzgerald created BGC Partners by separating its voice brokerage business. BGC Partners commenced trading in October 2004.

[124] GFI Group was founded in 1987 in New York as first broker of over-the-counter US government bond options. In 2007, the GFI EnergyMatch, a broker- assisted electronic energy trading platform, was launched in North America.

[125] Tradeweb Markets LLC was founded in 1996 which is the first multi-dealer online marketplace for U.S. Treasuries.

115. The positive abnormal return on the day of the acquisition indicates that the market perceived the investment in the Riversdale mining assets to be significantly accretive. Of course it proved to be otherwise, as Riversdale was sold for a small fraction of its acquisition price just two years later.

116. Finally, I have provided a basic, summary primer on the structure of the bond market and the impact that risk (or perceptions of risk) can have on a company's cost of financing.

117. I reserve the right to amend this report, including to reflect new information that becomes available to me in light of the discovery process and/or future rulings from the Court.

Signed on December 19, 2019

Respectfully submitted,

Exhibit 1
Rio Tinto Bonds Issued During the Period of Interest

Issue Date	Amount Issued	Coupon	Maturity Date	Note
5/20/2011	$700,000,000	2.50%	5/20/2016	
5/20/2011	$1,000,000,000	4.125%	5/20/2021	
9/19/2011	$500,000,000	2.25%	9/20/2016	
9/19/2011	$1,150,000,000	3.75%	9/20/2021	
3/22/2012	$500,000,000	1.125%	3/20/2015	*
3/22/2012	$500,000,000	2.00%	3/22/2017	*
3/22/2012	$1,000,000,000	3.50%	3/22/2022	*
3/22/2012	$500,000,000	4.75%	3/22/2042	*
8/21/2012	$1,250,000,000	1.625%	8/21/2017	*
8/21/2012	$1,000,000,000	2.875%	8/21/2022	*
8/21/2012	$750,000,000	4.125%	8/21/2042	*

Note: Bonds marked with "*" are mentioned in the Complaint at paragraphs 107 and 145.

Appendix A
Documents Considered

Court Documents

- "Securities and Exchange Commission, Plaintiff, v. Rio Tinto plc, Rio Tinto Limited, Thomas Albanese, and Guy Robert Elliott, Defendants." No. 1:17-cv-7994, United States District Court for the Southern District of New York, filed October 17, 2017.

Court Decisions and Securities Law

- *Basic, Inc. v. Levinson*, 485 U.S. 224 (1988).
- Bromberg & Lowenfels, 4 *Securities Fraud and Commodities Fraud*, § 8.6. (Aug. 1988).
- *Cammer, et al., v. Bruce M. Bloom, et al.*, 711 F. Supp. 1264 (D.N.J. 1989).
- *Halliburton Co., et al., v. Erica P. John Fund, Inc.*, 134 S. Ct. 2398 (2014).
- *Krogman v. Sterritt*, 202 F.R.D. 467 (N.D. Tex. 2001).

SEC Filings

- Rio Tinto SEC filings submitted during the Period of Interest, including, but not limited to:
  - Rio Tinto SEC Form F-3ASR filings.
  - Rio Tinto Prospectus Supplement filings.

Security Data

- Historical data for Rio Tinto ADR, S&P Metals and Mining Index, and the S&P 500 Total Return Index were obtained from S&P Capital IQ.
- Trade and quote data for Rio Tinto ADR during the Analysis Period and one hundred randomly selected companies trading on the New York Stock Exchange and NASDAQ for August 2011 were obtained from Tick Data, *see* https://tickapi.tickdata.com/. Companies trading on the New York Stock Exchange and NASDAQ for August 2011 were identified using Thomson Reuters Eikon.
- Institutional and insider holdings data was obtained from S&P Capital IQ.
- Rio Tinto ADR options data was obtained from Bloomberg.
- Rio Tinto ADRs outstanding data was obtained from Bloomberg.
- Rio Tinto ADR market capitalization percentiles were obtained from Bloomberg.
- Turnover velocity data for NYSE and NASDAQ were obtained from the World Federation of Exchanges, *see* https://www.world-exchanges.org/our-work/statistics.
- Descriptive bond data were obtained from Thomson Reuters Eikon.
- Bond rating and relative spread data from Moody's Investors Service

<u>Documents Submitted by Rio Tinto to SEC:</u>

- Wells Submission on Behalf of Rio Tinto Group, dated February 13, 2017.
- Correspondence from Richard W. Grime to the SEC, "Re: In the Matter of Rio Tinto (HO-12033)," dated June 6, 2017.
- Submission to the Office of the Chief Accountant on Behalf of Rio Tinto Group, dated June 6, 2017.
- Correspondence from Dorian Drew to Kevin Oh of the Financial Conduct Authority, "FCA Investigation: Rio Tinto Plc ("Rio Tinto") – Reply to the FCA's request dated 31 March 2017," dated May 19, 2017.

<u>Rio Tinto News</u>

- Rio Tinto news headlines and select articles downloaded from Factiva for the Period of Interest. The Factiva search for news over the Period of Interest resulted in 32,245 articles. News articles were obtained by executing a search via Factiva for "All Sources" with the company fields "Rio Tinto plc", "Rio Tinto ltd," and "Rio Tinto Group," for the period "December 1, 2010 – January 17, 2013."
- "ADR Report: Shares Mostly Higher On Mining Sector Gains," *Dow Jones Newswires*, April 8, 2011, 4:41 PM ET.
- "Alcan Pain Persists," *The Australian Financial Review*, August 6, 2010.
- "Brazil's CSN: Not 'In Principle' Seeking To Sell Riversdale Coal Stake," *Dow Jones International News*, March 29, 2011.
- "DJ Riversdale Board Accepts Rio Tinto's Acquisition Proposal," *Dow Jones Chinese Financial Wire*, January 10, 2011.
- "Miners Drive Europe's Gains," *The Wall Street Journal Online*, April 8, 2011.
- "Mining Sector Leads London Stocks Higher; ICAP Falls After Downgrade; Carnival Shares Also Drop," *MarketWatch*, April 8, 2011, 11:55 AM ET.
- "Mozambique Blocks Rio Tinto Coal Barging," *Agence France Press*, March 2, 2012.
- "Mozambique Rejects Coal Barging Study," *Reuters News,* March 1, 2012.
- "Rio Tinto Creeps Up to 36 pct Stake in Takeover Target Riversdale," *Reuters News*, March 22, 2011.
- "Rio Tinto Did Everything Wrong in a Deal that was One of the 'Worst Decisions Ever'," *Business Insider Australia*, February 15, 2013.
- "Rio Tinto Extends $3.9 bln Bid for Riversdale by 3 days," *Reuters News*, March 20, 2011.
- "Rio Tinto Impairments and Management Changes," *Regulatory News Service,* January 17, 2013
- "Rio Tinto May Battle Indian Steel Majors for Riversdale Mining," *Domain-B*, December 21, 2010.

- "Rio Tinto Nearly Reaches 47% Holding Target in Riversdale," *Reuters News*, April 5, 2011.
- "Rio Tinto Raises Bid for Riversdale, Offer Final," *Reuters News*, March 9, 2011.
- "Rio Tinto Says Wins 41 Percent of Riversdale Shares," *Agence France Presse*, March 30, 2011.
- "Rio Tinto Secures 14.9% Shares of Riversdale; Signed Pre-Bid Agreement with Plural Shareholders," *Tex Energy Report*, December 27, 2010.
- "Rio Tinto to Buy Alcan for $38 Billion," *Reuters*, July 12, 2007
- "Rio Tinto Writes Down $14bln, CEO Resigns," *Agence France Presse*, January 17, 2013.
- "Rio: $3bn Lost in Mozambique," *Financial Times*, January 17, 2013.
- "Tata Steel to Remain As Stakeholder In Riversdale Mining - Tata Steel MD," *Dow Jones Commodities Service*, February 21, 2011.
- "Tom Albanese Out at Rio Tinto as Alcan Bet Goes Awry," *The Globe and Mail*, January 17, 2013.
- "UPDATE: Rio Tinto Hits Riversdale Goal, Extends Offer," *Dow Jones Institutional News*, April 6, 2011.
- "UPDATE: Rio Tinto Now Needs Riversdale Approval for Takeover," *Dow Jones International News*, January 21, 2011.
- "UPDATE: Tata Steel Raises Riversdale Stake Amid Rio Tinto Bid," *Dow Jones International News*, March 1, 2011.
- "UPDATE 1-Brazil's CSN Raises Stake in Takeover Target Riversdale," *Reuters News*, February 8, 2011.
- "UPDATE 1-India's ICVL Will Not Counter Rio's Bid for Riversdale," *Reuters News*, January 27, 2011.
- "UPATE 1-Rio Tinto Extends Riversdale Bid as Stalemate Looms," *Reuters News*, February 9, 2011.
- "Update 2-Rio Tinto Gains Control of Riversdale Mining," *Reuters News*, April 8, 2011, 2:28 AM ET.
- "UPDATE 3-Rio Tinto Swings to Loss After Aluminum Writeoff," *Reuters News*, February 9, 2012.
- "WSJ BLOG/Deal Journal: Analysts React to Rio Tinto Management Reshuffle, Writedown," *Dow Jones News Service*, January 17, 2013.
- "Zambezi Too Costly For Eurasian Coal Barges," *The Australian Financial Review,* February 10, 2012.

<u>Rio Tinto Analyst Reports</u>

- Rio Tinto analyst reports supplied by Investext via Thomson Reuters for Period of Interest, including but not limited to:

- “Acquisition Accountability,” *Macquarie*, January 18, 2013.
- “Alcan Overhang Gone with CEO Departure & $14bn Impairment Charge,” *J.P. Morgan Cazenove*, January 17, 2013.
- “Big Write Downs and Management Changes, RIO Moving Ahead of Market Expectations on Both Counts,” *Liberum Capital*, January 17, 2013.
- “Capital Allocation Held to Account,” *Deutsche Bank*, January 17, 2013.
- “Change of Guard,” *RBC*, January 17, 2013.
- “Changing of the Guard,” *Jefferies*, January 17, 2013.
- “CEO Change. One Impairment Too Many,” *UBS*, January 17, 2013.
- “CEO Steps Down, but $14bn of Writedowns are Less of a Surprise - ALERT,” *J.P. Morgan Cazenove*, January 17, 2013.
- “Enter Sam Walsh,” *Nomura*, January 17, 2013.
- “FY2011 Earnings in Line; Dividend Increased; US$9.2B Aluminum Write-Off,” *BMO Capital Markets*, February 9, 2012.
- “One of Rio’s Small-to-Medium Transactions,” *UBS*, December 6, 2010.
- “OW: USD14bn in Write-downs and a New CEO,” *HSBC*, January 17, 2013.
- “Rio Looking at a A$3.5bn Riversdale Bid,” *Liberum Capital*, December 6, 2010
- “Rio Remains Our Top Pick on Higher Prices,” *Canaccord Genuity*, January 29, 2013.
- “Rio Tinto – Buy,” *Dolmen Daily*, April 8, 2011.
- “RIV Recommends RIO’s A$16/share Cash Bid,” *J.P. Morgan*, December 23, 2010.
- “Riversdale Acquisition in Line with Expectations but Probably Not a Done Deal,” *Société Générale*, December 23, 2010.
- “Talks with Riversdale Mining,” *J.P. Morgan*, December 6, 2010.
- “Why New CEO is Likely to be a Positive for Rio Tinto Shares,” *Société Générale*, January 18, 2013.
- “Write-offs Mostly a Non-event, New Management a Positive,” *Société Générale*, January 17, 2013.
- “Write Off of US$14B; CEO Tom Albanese Steps Down,” *BMO Capital Markets*, January 17, 2013.
- “Write This Down,” *CIMB*, January 18, 2013.

Rio Tinto Annual Reports

- Rio Tinto 2010 Annual Report
- Rio Tinto 2011 Annual Report
- Rio Tinto 2012 Annual Report
- Rio Tinto 2013 Annual Report
- Rio Tinto 2014 Annual Report

Academic/Industry Literature

- A. Craig MacKinlay, "Event Studies in Economics and Finance," *Journal of Economic Literature* Vol. 35, 1997, pp. 13-39.
- Alon Brav & Reuven Lehavy, "An Empirical Analysis of Analysts' Target Prices: Short-Term Informativeness and Long-Term Dynamics," *The Journal of Finance* Vol. 58 (5), 2003, pp. 1933-1967.
- A.R.W, "The NASD – An Unique Experiment in Cooperative Regulation," *Virginia Law Review* Vol. 46 (8), 1960, pp. 1586-1600.
- Ayako Yasuda, "Do Bank Relationships Affect the Firm's Underwriter Choice in the Corporate-Bond Underwriting Market?" *The Journal of Finance* Vol. 60 (3), 2005, pp. 1259-1292.
- Brad M. Barber, Paul A. Griffin & Baruch Lev, "The Fraud-on-the-Market Theory and the Indicators of Common Stocks' Efficiency," *The Journal of Corporation Law*, 1994.
- Choel S. Eun & Sanjiv Sabherwal, "Cross-Border Listings and Price Discovery: Evidence from U.S.-Listed Canadian Stocks," *The Journal of Finance* Vol. 58 (2), 2003, pp. 549-575.
- "Corporate Operational Underwriting Process," The Bond Market Association & The Depositary Trust & Clearing Corporation, December 9, 2004.
- "Corporate Performance: What Do Investors Want to Know?" *PwC*, September 2014.
- Damodar N. Gujarati, *Basic Econometrics* (3rd ed., 1995), McGraw Hill.
- Dan L. Worrell, Wallace N. Davidson III, & John L. Glascock, "Stockholder Reactions to Departures and Appointments of Key Executives Attributable to Firings," *The Academy of Management Journal* Vol. 36 (2), 1993, pp. 387-401.
- Daniel Bradley, Jonathan Clarke, Suzanne Lee, & Chayawat Ornthanalai, "Are Analysts' Recommendations Informative? Intraday Evidence on the Impact of Time Stamp Delays," *The Journal of Finance* Vol. 69 (2), 2014, pp. 645-673.
- David I. Tabak & Frederick C. Dunbar, "Materiality and Magnitude: Event Studies in the Courtroom," *Litigation Services Handbook, The Role of the Financial Expert* (3rd ed., 2001), Chapter 19.
- Doron Avramov, Tarun Chordia & Amit Goyal, "Liquidity and Autocorrelations in Individual Stock Returns," *The Journal of Finance* Vol. 61 (5), 2006, pp. 2365-2394.
- Edith S. Hotchkiss & Tavy Ronen, "The Informational Efficiency of the Corporate Bond Market: An Intraday Analysis," *The Review of Financial Studies* Vol. 15 (5), 2002, pp. 1325-1354.
- Eugene F. Fama, "Efficient Capital Markets: A Review of Theory and Empirical Work," *The Journal of Finance* Vol. 25 (2), 1970, pp. 383-417.
- Eugene P.H. Furtado & Michael S. Rozeff, "The Wealth Effects of Company Initiated Management Changes," *Journal of Financial Economics* Vol. 18, 1987, pp. 147-160.
- Frank J. Fabozzi, Franco Modigliani & Frank J. Jones, *Foundations of Financial Markets and Institutions* (4th ed., 2010), Prentice Hall.

- Frederick C. Dunbar & Arun Sen, "Counterfactual Keys to Causation and Damages in Shareholder Class-Action Lawsuits," *Wisconsin Law Review* Vol. 2009 (2), 2009, pp. 199-242.
- Hendrik Bessembinder, "Trade Execution Costs and Market Quality after Decimalization," *Journal of Financial and Quantitative Analysis* Vol. 38 (4), 2003, pp. 747-777.
- Hendrik Bessembinder & William Maxwell, "Markets: Transparency and the Corporate Bond Market," *The Journal of Economic Perspectives* Vol. 22 (2), 2008, pp. 217-234.
- John J. Binder, "The Event Study Methodology Since 1969," *Review of Quantitative Finance and Accounting* Vol. 11, 1998, pp. 111-137.
- Joseph D. Piotroski & Darren T. Roulstone, "The Influence of Analysts, Institutional Investors, and Insiders on the Incorporation of Market, Industry, and Firm-Specific Information into Stock Prices," *The Accounting Review* Vol. 79 (4), 2004, pp.1119-1151.
- Karl-Adam Bonnier & Robert F. Bruner, "An Analysis of Stock Price Reaction to Management Change in Distressed Firms," *Journal of Accounting and Economics* Vol. 11, 1989, pp. 95-106.
- Kenneth D. Garbade & Jeffrey F. Ingber, "The Treasury Auction Process: Objectives, Structure, and Recent Adaptations," *Federal Reserve Bank of New York: Current Issues in Economics and Finance* Vol. 11 (2), 2005.
- Mark R. Huson, Paul H. Malatesta, & Robert Parrino, "Managerial Succession and Firm Performance," *Journal of Financial Economics* Vol. 74, 2004, pp. 237-275.
- Matthew C. Clayton, Jay C. Hartzell, & Joshua Rosenberg, "The Impact of CEO Turnover on Equity Volatility," *The Journal of Business* Vol. 78 (5), 2005, pp. 1779-1808.
- Michael C. Jensen, "Some Anomalous Evidence Regarding Market Efficiency," *Journal of Financial Economics* Vol. 6 (2/3), 1978, pp. 95-101.
- Phillip A. Braun, Daniel B. Nelson, & Alain M. Sunier, "Good News, Bad News, Volatility, and Betas," *The Journal of Finance* Vol. 50 (5), 1995, pp. 1575-1603.
- Raman Kumar, Atulya Sarin & Kuldeep Shastri, "The Impact of Options Trading on the Market Quality of the Underlying Security: An Empirical Analysis," *The Journal of Finance* Vol. 53 (2), 1998, pp. 717-732.
- Randall S. Thomas & James F. Cotter, "Measuring Securities Market Efficiency in the Regulatory Setting," *Law and Contemporary Problems* Vol. 63 (3), 2000, pp. 105-122.
- Richard A. Brealey, Stewart C. Myers, & Franklin Allen, *Principles of Corporate Finance* (10th ed., 2011), McGraw Hill.
- Roger D. Huang & Hans R. Stall, "Dealer Versus Auction Markets: A Paired Comparison of Execution Costs on NASDAQ and the NYSE," *Journal of Financial Economics* Vol. 41, 1996, pp. 313-357.
- Stephen A. Ross, "Options and Efficiency," *The Quarterly Journal of Economics* Vol. 90, 1976, pp. 75-89.

- Stewart D. Friedman & Harbir Singh, "CEO Succession and Stockholder Reaction: The Influence of Organizational Context and Event Content," *The Academy of Management Journal* Vol. 32 (4), 1989, pp. 718-744.
- U.S. Department of the Treasury, "Electronic Trading in the Secondary Fixed Income Markets."
- Yakov Amihud & Haim Mendelson, "Asset Pricing and the Bid-Ask Spread," *Journal of Financial Economics* Vol. 17, 1986, pp. 223-249.
- Yakov Amihud, Haim Mendelson & Lasse Heje Pedersen, "Liquidity and Asset Prices," *Foundations and Trends in Finance* Vol. 1 (4), 2005, pp. 269-364.
- William H. Greene, *Econometric Analysis* (6th ed., 2008), Prentice Hall.
- William Sharpe, Gordon J. Alexander & Jeffrey W. Bailey, *Investments* (5th ed., 1995), Prentice Hall.
- Zvi Bodie, Alex Kane, & Alan J. Marcus, *Investments* (4th ed., 1999), Irwin McGraw-Hill.

<u>Other</u>

- https://www.sec.gov/investor/alerts/adr-bulletin.pdf
- https://www.londonstockexchange.com/traders-and-brokers/security-types/ordinary-shares/ordinary-shares.htm
- https://www.tradinghours.com/exchanges
- https://www.nyse.com/markets/hours-calendars
- https://www.londonstockexchange.com/products-and-services/technical-library/millennium-exchange-technical-specifications/millennium-exchange-technical-specifications.htm
- https://www.riotinto.com/aboutus/history-4705.aspx
- http://www.sifma.org/research/statistics.aspx
- https://statistics.world-exchanges.org/PredefinedReport
- http://www.finra.org/
- https://www.finra.org/sites/default/files/TRACE_Overview.pdf
- https://www.mergentonline.com/login.php
- http://www.sec.gov/answers/mktmaker.htm
- http://wallstreet.cch.com/LCM/Sections/
- https://www.nyse.com/market-model
- https://www.nasdaqtrader.com/Trader.aspx?id=TradingUSEquities
- https://www.sec.gov/files/formf-3.pdf
- www.sec.gov/about/forms/forms-3.pdf
- https://tickapi.tickdata.com/

Appendix B

Albert Metz, PhD

Managing Director

Global Economics Group

CONTACT DETAILS

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22 Cortlandt Street, Suite 1600
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Direct : (917) 975-1211
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OVERVIEW

Dr. Albert Metz is a Managing Director in the financial, regulatory, data mining, and antitrust practices of Global Economics Group based in New York. Prior to joining Global Economics Group, Dr. Metz worked for 15 years at Moody's Investors Service, specializing in corporate, financial institution, sovereign and structured finance credit research and analysis. Most recently he was Managing Director of the Global Methodology Development Group, a group of nearly 100 professionals with responsibility for developing credit models and methodologies for all asset classes across all lines of business. Dr. Metz also worked to create the Innovation Group, a team dedicated to leveraging machine learning and data mining techniques. Prior to that Dr. Metz was the Managing Director of Credit Policy Research, including Default Research, Model Development and Verification, and Technology. Dr. Metz frequently met with regulators and policy makers to discuss credit risk, credit ratings performance, risk modeling, and anti-trust and other policy questions.

Dr. Metz's main areas of specialization are econometrics and statistics, finance, institutional and consumer credit, real estate, risk modeling and assessment, and numerical methods. He is the author of copyrighted and patented models. In addition to credit risk, his experience also includes work in asset pricing, real estate, and government. His work has been featured in the media such as the *Wall Street Journal*, *The Financial Times, The Economist, CNNMoney, CNBC, Forbes, Bloomberg, Fox Business, BusinessWeek, Washington Post, Huffington Post,* and *Reuters,* among others.

Dr. Metz has developed several models of corporate and consumer credit, financial risk contagion, real estate market performance measures, and pharmaceutical drug development, to name a few. He has developed patented models of default and credit rating transitions and trademarked models of regional real estate prices. Dr. Metz's models of corporate and financial institution default rates have consistently outperformed street forecasts, including through the financial crisis of 2008. He has developed models of residential mortgage default, prepayment and loss which have been used to assess the credit risk of hundreds of billions of dollars in securitizations. Dr. Metz has also contributed to books on emerging markets and sovereign risk.

In pharmaceuticals, he co-developed a model to estimate the likelihood of drugs failing and succeeding each of the clinical stages of the Food and Drug Administration, and their expected

durations in each of these phases. This model has become one of the two most used by industry analysts to assist in valuing pharmaceutical and biotechnology pipelines. His research on pharmaceuticals has been discussed in books on how to value pharmaceutical and biotechnology companies, and on publications pertaining to health care, intellectual property and cartels.

Dr. Metz has been at the forefront of the empirical detection of some conspiracies and manipulations. In 2008 he flagged the possibility of collusion in LIBOR prior to the launch of large scale investigations. He has also flagged the possibility of manipulation and collusion in gold markets in 2013.

Dr. Metz has also co-authored several articles and papers on econometric methods and screens for conspiracies, manipulations and fraud. He has published in peer-reviewed journals such as the Journal of Pharmaceutical Finance, Economics and Policy, and the Journal of Banking and Finance. His work has also appeared in trade publications including The Antitrust Source, and The Competition Policy International Antitrust Chronicle.

Dr. Metz holds a Ph.D. and a Masters in Economics from the University of Chicago where he was the first student ever awarded Distinction in the field of Econometrics. He also holds a Bachelor of Arts in Economics from Occidental College where he graduated summa cum laude.

PROFESSIONAL EXPERIENCE

MOODY'S INVESTORS SERVICE (NEW YORK) **2003 - 2018**

Managing Director of the Global Methodology Development Group, managing a team of about 100 analysts. Research and technical responsibilities included:

- Development of credit rating methodologies and models for all produce lines, including corporate, financial institutions, sovereign, sub-sovereign, municipal and structured finance
- Default and ratings performance research for all product lines, including corporate, financial institutions, sovereign, sub-sovereign, municipal and structured finance
- Model verification and version control
- Regulatory reporting

Managing Director of Global Credit Policy Research, a group of 40 analysts. Research and technical responsibilities included:

- Default and ratings performance research for all product lines, including corporate, financial institutions, sovereign, sub-sovereign, municipal and structured finance
- Rating methodology and credit model development
- Rating methodology and credit model validation
- Model verification and version control
- Regulatory reporting

Research Economist, Credit Policy Default Research, as Vice President and Senior Vice President

- Published research primarily on corporate default and ratings performance
- Represented Moody's at industry conferences
- Built a patented default and rating transition model
- Built a credit rating predictor model

Select modeling and methodology development projects include:

- US Residential Mortgages: lead developer of mortgage default and loss severity models using data for nearly 1.4 million private label mortgages. These models represent the core of Moody's new US residential methodology. The models provide the monthly term structure of default and prepayment risks as well as the first and second moments of the borrower's loss-given-default distribution. Easily permits stressing a portfolio of mortgage exposures based on macroeconomic scenarios.
- Global Bank Stress Testing: lead the effort to develop a new, consistent framework for stress-testing the asset portfolio of banks globally. A reduced from approach, it applies stress multiples to expected losses of different asset classes.
- Global Bank Credit Scorecard: developed an innovative credit scorecard for the Baseline Credit Assessments of global banks. The scorecard is based on a regression analysis of bank failures during the recent financial crisis and incorporates bank balance sheet information, macroeconomic variables and assessments of sovereign credit risk.
- Corporate Defaults: lead developer of the patented Credit Transition Model, Moody's propriety model of corporate (financial and non-financial) credit rating transitions and default. The model forecasts all rating transitions, including upgrades, downgrades, default and withdrawal at the individual issuer level by conditioning on issuer-specific information and macroeconomic drivers. Easily permits a coherent stress-test of corporate exposures based on macroeconomic scenarios. These scenarios could consider not just default, but transitions across rating boundaries (such as falling from investment-grade into speculative-grade) which may be critical to a portfolio manager.
- Credit Rating Prediction: lead developer of Moody's proprietary Rating Predictor Model which maps credit ratios to implied credit ratings. The model significantly outperforms standard approaches such as linear regression and ordered Probit models. The model allows counter-factual analysis to determine how credit ratings might change given changes in underlying balance sheet metrics.

CONGRESSIONAL BUDGET OFFICE (WASHINGTON DC) **2002 – 2003**

Principal Analyst in the Microeconomics and Finance Division. Research and policy projected included:

- Econometric Modeling:
  - Developed a model to forecast bank deposits, assessable and insured, for use by the Budget Analysis Division

  - Estimated a discrete time, multiple-destination mixed proportional hazards model of pharmaceutical development
  - Estimated Logistic regressions of first stages of the FHA loss mitigation program
  - Specified a two-stage Probit model of additional stages of FHA loss mitigation program to correct for endogenous selection

- Financial Analysis:
  - Used derivative pricing theory to estimate the market value of risk born by the government through various contingent programs

SECURITY CAPITAL GROUP, INC (CHICAGO) **1998 - 2002**

Chief Economist of the real estate investment company. Research projects included:

- Commercial Property Rent and Occupancy: developed proprietary forecasting models of rent and occupancy levels for multifamily, office, retail and warehouse properties at the MSA level.

- Optimal Property Location: developed location models for the Assisted Living and Self-Storage sectors in the U.S. and Europe. The models informed asset acquisition/disposition decisions.

EDUCATION

UNIVERSITY OF CHICAGO

Ph.D. Department of Economics (2002)
Primary Fields: Econometrics, Macroeconomics and Monetary Economics, Numerical Methods
Secondary Fields: Asset Pricing, Public Finance
Awards: Award of Distinction in Econometrics, 2000
First Ever Student Award this Distinction in the Economics Department
M.A. Economics (1997)

OCCIDENTAL COLLEGE

B.A. Economics (1994)
Awards: summa cum laude / Phi Beta Kappa junior year / College Honors
Senior Comprehensive Distinction / Wall Street Journal Award for excellence in economics

SELECTED PUBLICATIONS, WORKING PAPERS AND PRESENTATIONS

- *Big Data, Artificial Intelligence and Antitrust: What's New and What is Not?* with Rosa Abrantes-Metz, Competition Policy International, Antitrust Chronicle, July 2018
- *Comments on ICE Benchmark Administration's Position Paper of 20 October 2014: LIBOR Reform,* with Rosa Abrantes-Metz, December 18, 2014
- Contributed book chapter to *Emerging Markets and Sovereign Risk,* edited by Nigel Finch, December 2014
- *US RMBS Analytics: Modeling the Probability of Default*, Moody's Special Comment, July 2014
- *US RMBS Analytics: Modeling Loss Severity Given Default*, Moody's Special Comment, July 2014
- Are Silver Prices Being Fixed? with Rosa Abrantes-Metz, Working Paper, October 2014
- Are Gold Prices Being Fixed?" with Rosa Abrantes-Metz, Working Paper, February 2014
    - Assisted in triggering litigation and investigations worldwide
    - Extensively discussed in the media including Bloomberg, Reuters, Wall Street Journal, The Economist, The Financial Times, Kitco
- *Panel Discussion: The Challenges of Credit Rating Agencies,* NBER 2014
- *Panel Discussion: The Regulation of Credit Rating Agencies,* NBER 2013
- *The Cyclical Nature of Corporate Defaults*, presentation to the 22nd Annual High Yield Bond Conference, NYSSA, 2012
- *How Far Can Screens Go in Distinguishing Explicit from Tacit Collusion? New Evidence from the Libor Setting*," with Rosa Abrantes-Metz, *Competition Policy International Antitrust Chronicle*, March (1) 2012
    - Discussed in U.S. Senate Hearings on Cartel Detection, November 2013
    - Discussed in Litigation on USD LIBOR by both Plaintiffs and Defendants
- *Testing Equalities of Spectrums for Paired Time Series at Chosen Frequencies: Application to Sovereign Credit Default Swaps,* with Rosa Abrantes-Metz, Working Paper 2011
- *Applying The Vasicek Distribution to Multi-Sector and Small Portfolios,* Working Paper 2011
- *LIBOR Manipulation?,* with Rosa Abrantes-Metz, Michael Kraten, and Gim Seow, *Journal of Banking and Finance*, 36, 136-150, 2012
    - *List of Most Download Journal of Banking and Finance Articles,* 2012
    - August 2008 Working Paper, first to put forward the possibility of collusion among LIBOR contributing banks
    - Featured in the WSJ, "U.S. Probe Presents Dilemma Over LIBOR," published March 18, 2011

    - Featured in the FT, “Stakes are High in Setting the Libor,” published March 25, 2011
    - Featured in The Economist, “The LIBOR scandal and the rotten heart of finance: A scandal over key interest rates is about to go global,” The Economist, July 7, 2012, pages 25-28
    - Featured in BBC Radio on Libor findings and reform, aired January 17, 2013
    - Featured in *Sky News TV*, UK, on Royal Bank of Scotland’s settlement with authorities on LIBOR manipulation, The Boulton and Co Today TV Show, February 6, 2013
    - Featured in Testimony in the UK Parliament on LIBOR
- *The Determinants of Cartel Duration,* with Rosa Abrantes-Metz and John M. Connor, Working Paper, 2010
- *The Determinants of Pharmaceutical Review, Success and Duration,* with Rosa Abrantes-Metz and Christopher P. Adams, Working Paper, April 2008
- *A Cyclical Model of Multiple-Horizon Credit Rating Transitions and Default,* available at SSRN, June 2007
- *On the Prediction of Credit Ratings,* available at SSRN, August 2007
- *Pharmaceutical Development Phases: A Duration Analysis,* with Rosa Abrantes-Metz and Christopher P. Adams, *Journal of Pharmaceutical Finance, Economics & Policy*, 14 (2006), 19–42
    - Presented at the International Industrial Organization Conference in Boston in March 2003
    - Presented at the Econometrics Society Meetings in Chicago in June 2003
    - Discussed in books on health care and on how to value pharmaceutical and biotech R&D pipelines
- *Empirical Facts and Innovation Markets: Analysis of the Pharmaceutical Industry*, with Rosa Abrantes-Metz and Christopher P. Adams, The Antitrust Source, Issue 4 (4), March 2005
- *Forecasting Corporate Defaults*
    - Presented at Moody’s Credit Policy Conference in Copenhagen, Denmark, *May 2007*
    - Presented at Moody’s Credit Policy Conference in Venice, Italy, *September 2007*
    - Presented at Moody’s Credit Policy Conference in Chicago, *October 2008*
- *The Role of Risk-Mitigation Strategies in Community Development: A Case Study of the FHA Lease Mitigation Program*, with Charles A. Capone, Jr.
    - Presented at the Federal Reserve System’s Conference on Sustainable Community Development in Washington in March 2003
- *Forecasting Deposit Growth*, CBO Technical Paper, 2003-6
- *Estimating the Tax Shelter Value of Commercial Office Real Estate: Consequences of the Tax Reform Act of 1986*
    - PhD Dissertation in Economics, University of Chicago, June 2002.

  - Presented at the St. Louis Federal Reserve Board and Congressional Budget Office in January 2002

PATENTED AND TRADEMARKED WORK

- *Moody's Credit Transition Model*
- *Dynamic Interactive Forecasting of Rent and Occupancy of Commercial Real Estate Sectors*

SELECTED INTERVIEWS AND OTHER MEDIA COVERAGE

- *U.S. Junk Bond Defaults to Reach 3% By Year-End,* July 15, 2015
  - Available at *https://www.barrons.com/articles/u-s-junk-bond-defaults-to-reach-3-by-year-end-says-moodys-1436984135*
- *Gold: In a Fix, The Economist print edition,* March 8, 2104
  - Also available at *http://www.economist.com/news/finance-and-economics/21598676-new-concerns-surround-way-world-gold-rices-set-fix-mr-bond*
- *London Gold Broker Says Swings in Prices No Sign of Manipulation, Bloomberg,* March 5, 2014
  - Available at *http://www.bloomberg.com/news/2014-03-05/london-gold-broker-says-swings-in-prices-no-sign-of-manipulation.html*
- *Gold Fix Study Shows Signs of Decade of Bank Manipulation, Bloomberg,* February 28, 2014
  - Available at http://www.bloomberg.com/news/2014-02-28/gold-fix-study-shows-signs-of-decade-of-bank-manipulation.html.
- *Speculative corporate default rate rises, Global Investor Magazine,* June 11, 2013
  - Available at *http://www.globalinvestormagazine.com/Article/3217314/Speculative-corporate-default-rate-rises.html*
- *Speculative grade corporate defaults rise says Moody's, FTSE Global Markets,* May 8, 2013
  - Available at *http://www.ftseglobalmarkets.com/news/spec-grade-corporate-defaults-rise-says-moodys.html*
- *Global Corporate Default Rate Remains Low in 2012 Despite More Defaults, CFO Innovation,* March 7, 2013
  - Available at *http://www.cfoinnovation.com/content/global-corporate-default-rate-remains-low-2012-despite-more-defaults*
- *Moody's: Global Corporate Default Rate Rises in 2012 Against Global Uncertainties, BornToPost,* March 4, 2013

    - Available at http://www.theborneopost.com/2013/03/04/moodys-global-corporate-default-rate-rises-in-2012-against-global-uncertainties/
- *Moody's predicts that the global rate will hold steady in 2013, Investment Executive,* March 1, 2013
    - Available at *http://www.investmentexecutive.com/-/corporate-defaults-rose-in-2012*
- *Corporate Debt Ratings Are Getting Cut At The Fastest Rate Since '0.9, Business Insider,* December 26, 2012
    - Available at http://www.businessinsider.com/corporate-debt-ratings-are-getting-cut-at-the-fastest-rate-since-09-2012-12#ixzz2kx7IDgZ2
- *Moody's: Number of "Fallen Angels" Declines Sharply during Q3 2012, HighBeam Research,* December 5, 2012
    - Available at *http://www.highbeam.com/doc/1G1-310974502.html*
- *Moody's: Global spec-grade corporate default rate ends at 2.7% in second quarter, finanzen.com,* October 7, 2012
    - Available at *http://www.finanzen.net/nachricht/anleihen/Moody-s-Global-spec-grade-corporate-default-rate-ends-at-2-7-in-second-quarter-2012-1946603*
- *Low Failure Rates Mask Tough Times, Financial Times,* September 20, 2012
    - Available at http://www.ft.com/intl/cms/s/0/4371bd7e-f676-11e1-9dff-00144feabdc0.html#axzz2kqVw0Txn.
- *Moody's Default Rate 2.3% at End of Q1, Barrons,* April 9, 2012
    - Available at http://blogs.barrons.com/incomeinvesting/2012/04/09/moodys-default-rate-2-3-at-end-of-q1/
- *Corporate Default Rate May Rise to 2.4% in 2012, Moody's Says, BloombergBusinessweek,* December 8, 2011
    - Available at http://www.businessweek.com/news/2011-12-08/corporate-default-rate-may-rise-to-2-4-in-2012-moody-s-says.html
- *Now May Be the Time for These Double Digit Yielders, Top Stock Analysts,* September 19, 2011
    - Available at http://www.topstockanalysts.com/index.php/2011/09/19/now-may-be-the-time-for-these-double-digit-yielders/
- *Moody's: Global Junk Default Rate Edges Down to 1.8% in August, Wall Street Journal,* September 8, 2011
    - Available at http://online.wsj.com/article/BT-CO-20110908-710915.html
- *Study Claims Rating Agencies Favor Asset Classes that Provide the Most Revenue, On Wall Street,* August 30, 2011
    - Available at http://www.onwallstreet.com/news/credit-rating-study-asset-class-treatment-2674895-1.html
- *Corporate Default Rate Declining: Moody's, Investment Executive,* August 8, 2011
    - Available at http://www.investmentexecutive.com/-/news-59162

- *Moody's Says Europe Defaults Slowed in 2010, First Half 2011, Bloomberg,* August 4, 2011
    - o Available at http://www.bloomberg.com/news/2011-08-04/junk-default-rate-faces-upward-pressure-in-europe-moody-s-says.html
- *Corporate Debt Defaults Running in Line with Expectations, RBR.com News,* July 14, 2011
    - o Available at http://www.rbr.com/media-news/corporate-debt-defaults-running-in-line-with-expectations.html
- *High-Yield Defaults Still Falling, Moody's Reports, FundWeb.com,* May 6, 2011
    - o Available at http://www.fundweb.co.uk/high-yield-defaults-still-falling-moody%E2%80%99s-reports/1030620.article
- *U.S. Probe Presents Dilemma Over Libor, Wall Street Journal,* March 18, 2011
    - o Available at http://online.wsj.com/article/SB100014240527487038182045762059916985482 86.html
- *Global Default Rates Continued to Fall in November – Moody's, Wall Street Journal,* December 7, 2010
    - o Available at http://online.wsj.com/article/BT-CO-20101207-704652.html
- *Moody's: Global Default Rate Fell to 3.3% in November 2010, iStockAnalyst,* December 7, 2010
    - o Available at http://www.istockanalyst.com/article/viewiStockNews/articleid/4725188
- *Junk Bond Defaults in U.S. May Drop to 2.2% in 2011, Moody's Report says, Bloomberg,* November 4, 2010
    - o Available at http://www.bloomberg.com/news/2010-11-04/junk-bond-defaults-in-u-s-may-drop-to-2-2-in-2011-moody-s-report-says.html
- *Junk-bond default rate falls to 4%, National Post,* October 8, 2010
    - o Available at http://www.nationalpost.com/todays-paper/Junk+bond+default+rate+falls/3641515/story.html
- *Global Default Rate Fell to Two-Year Low in September, Business Week,* October 8, 2010
    - o Available at http://www.businessweek.com/news/2010-10-08/global-default-rate-fell-to-two-year-low-in-september.html
- *Moody's: Aug Global Spec Grade Default Rate 5.0% V 12.3% Yr Ago, iMarketnews.com,* September 8, 2010
    - o Available at http://imarketnews.com/node/18900
- *Moody's: Global Speculative-Grade Default Rate 5.5% in July, iMarketNews.com,* August 5, 2010
    - o Available at http://imarketnews.com/node/17538
- *How to Tell a Nation is at Risk, New York Times,* July 15, 2010

  - Available at http://www.nytimes.com/2010/07/16/business/economy/16norris.html?_r=1
- *Moody's: Global Default Rate ends at 6.1 percent in the second quarter of 2010, CPI Financial,* July 12, 2010
  - Available at http://www.cpifinancial.net/v2/news.aspx?v=1&aid=5498&sec=Investment%20Banking
- *Global junk default rate to fall below 2 pct – Moody's, Reuters,* July 8, 2010
  - Available at http://www.reuters.com/article/idUSN0822543320100708
- *The Falling Failure Rate, Forbes,* June 7, 2010
  - Available at http://www.forbes.com/
- *Moody's Drop in Default Rates Expected, The Associated Press,* September 21, 2009
  - Available at http://abcnews.go.com/Business/wireStory?id=8632900
- *Laboring Over Libor: Pension Risk Matters, Hotfeeder Business News,* October 16, 2008
  - Available at http://www.hotfeeder.com/business/_217549
- *What's My Metric? Drug-Company CFOs, CFO.com,* November 29, 2005
  - Available at http://www.cfo.com/article.cfm/5242743/4?f=search

Appendix C

I. RIO TINTO ADRs TRADED IN AN EFFICIENT MARKET DURING THE PERIOD OF INTEREST

1. The fraud on the market theory is based on the understanding that in an efficient market (one in which widely-available public information is quickly incorporated into the market price of a security), all purchasers implicitly rely on any material misrepresentations or omissions since the value of those misrepresentations or omissions is incorporated into the purchase price. The "fraud on the market" theory was first addressed by the U.S. Supreme Court in *Basic Inc. v. Levinson*:

> … [I]n an open and developed securities market, the price of a company's stock is determined by the available material information regarding the company and its business…Misleading statements will therefore defraud purchasers of stock even if the purchasers do not directly rely on the misstatements…The causal connection between the defendants' fraud and the plaintiffs' purchase of stock in such a case is no less significant than in a case of direct reliance on misrepresentations.[1]

2. The Supreme Court reaffirmed this theory in *Halliburton II*:

> More than 25 years ago, we held that plaintiffs could satisfy the reliance element of the Rule 10b-5 cause of action by invoking a presumption that a public, material misrepresentation will distort the price of stock traded in an efficient market, and that anyone who purchases the stock at the market price may be considered to have done so in reliance on the misrepresentation. We adhere to that decision and decline to modify the prerequisites for invoking the presumption of reliance.[2]

3. As stated in *Basic* and reaffirmed in *Halliburton II*, in an open, developed and efficient market, market prices reflect what is publicly known about a company. If a company provides the market with misleading information regarding its financial strength, assets or business practices, the market price will be inflated (or deflated) compared to what the price would have been if the truth were known, but-for the misleading information. Thus, in an

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[1] *Basic Inc. v. Levinson*, 485 U.S. 224, 241-42 (1988) ("*Basic*").

[2] *Halliburton Co. v. Erica P. John Fund, Inc.*, 134 S. Ct. 2398, 2418 (2014) ("*Halliburton II*").

efficient market, where the plaintiff asserts there were material misrepresentations or omissions, all purchasers implicitly relied on those misrepresentations and/or lack of disclosure by paying the inflated (or deflated) price.

4. It is an empirical exercise to determine whether the market for a security was "open and developed" or "efficient" to the degree required for a presumption of reliance under the "fraud on the market" theory.[3] The Nobel prize winning economist Dr. Eugene Fama's seminal research first outlined definitions of an "efficient market."[4] He described different levels of efficiency which he called "weak-form," "semi-strong-form," and "strong-form" efficiency.[5]

5. The market efficiency standard adopted by *Basic* and reaffirmed by *Halliburton II* as necessary for the presumption of reliance conforms most closely with Dr. Fama's "semi-strong form" efficiency, meaning that all publicly available information (whether true or false) is reflected in a security's current market price. This further implies that security prices adjust to new publicly available information rapidly and in an unbiased fashion so that it is impossible to earn excess returns by trading on that information. *Basic* stated: "In an open and developed

[3] To recognize the presumption of reliance, the *Basic* Court explained, was not "conclusively to adopt any particular theory of how quickly and completely publicly available information is reflected in market price." *Basic*, 485 U.S. at 248 n.28. The *Basic* Court instead based the presumption on the fairly modest premise that "market professionals generally consider most publicly announced material statements about companies, thereby affecting stock market prices." *Basic*, 485 U.S. at 246 n.24. *Basic's* presumption of reliance thus does not rest on a "binary" view of market efficiency, but rather, market efficiency is a matter of degree.

[4] Eugene F. Fama, "Efficient Capital Markets: A Review of Theory and Empirical Work," *The Journal of Finance* Vol. 25 (2), 1970, pp. 383-417 at p. 383.

[5] "Weak-form" efficiency requires that historical prices are not predictive of future prices. Under this form of efficiency, excess returns cannot be earned using strategies based on historical prices. Therefore, technical analysis will not produce consistent excess returns over time. "Semi-strong form" efficiency implies that all public information is reflected in a stock's current market price. Security prices adjust to new publicly available information rapidly and in an unbiased fashion so that it is impossible to earn excess returns by trading on that information. Under this form of efficiency, neither fundamental nor technical analysis can produce consistent excess returns. "Strong-form" efficiency implies all information in the market, whether public or private, is accounted for in the market price. In this market, investors cannot consistently earn excess returns over a long period of time even if they have inside information.

securities market, the price of a company's stock is determined by the available material information regarding the company and its business."[6] The Supreme Court's effective adoption of the "semi-strong form" efficiency standard is economically sensible because it recognizes that insiders often possess non-public information and that securities prices do not necessarily reflect this non-public information, but that to presume reliance, the market price must reflect publicly available information.

6. In the next section, I review multiple factors that are regularly considered by financial economists and courts in determining whether the market for a particular security is efficient. Many of these factors were identified in *Cammer v. Bloom*[7] and *Krogman v. Sterritt*.[8] The *Cammer* decision relied on Bromberg & Lowenfels' definition of efficiency. As articulated below, the adopted definition of efficiency is consistent with Fama's definition of "semi-strong" efficiency. For the purposes of this exercise, I adopt Bromberg & Lowenfels' definitions for the terms "open," "developed," and "efficient" as described below:

> An *open market* is one in which anyone, or at least a large number of persons, can buy or sell.
>
> A *developed market* is one which has a relatively high level of activity and frequency, and for which trading information (*e.g.*, price and volume) is widely available. It is principally a secondary market in outstanding securities. It usually, but not necessarily, has continuity and liquidity (the ability to absorb a reasonable amount of trading with relatively small price changes).
>
> An *efficient market* is one which rapidly reflects new information in price.

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[6] *Basic,* 485 U.S. at 241.

[7] *Cammer, v. Bloom*, 711 F. Supp. 1264 (D.N.J. 1989) ("*Cammer*").

[8] *Krogman v. Sterritt*, 202 F.R.D. 467 (N.D. Tex. 2001) ("*Krogman*"). The factors identified by the *Krogman* Court are 1) market capitalization, 2) the percentage of stock not held by insiders (the float) and 3) bid-ask spread.

> These terms are cumulative in the sense that a developed market will almost always be an open one. And an efficient market will almost invariably be a developed one.[9]

7. I also consider a number of other factors that courts have utilized beyond the *Cammer* and *Krogman* factors. Because none of the individual tests or metrics is determinative as to whether a particular market is efficient, it is important to consider the identified efficiency factors as a whole.

II. APPLICATION OF EFFICIENCY FACTORS TO RIO TINTO ADRs

A. OVERVIEW

8. After giving careful consideration to each of the efficiency factors described in detail below, I find that each factor supports the conclusion that the market for Rio Tinto ADRs was efficient at least throughout the period of interest. In addition to the discussion below, **Exhibit C1** summarizes how, for each of the factors examined, the empirical evidence supports a finding that Rio Tinto ADRs traded in an efficient market. As further background to my analyses, **Exhibit C2** displays Rio Tinto ADRs closing price and trading volume for each day throughout the period of interest.

9. In summary, and as discussed more fully below, Rio Tinto ADRs traded in an efficient market during the period of interest. First, the average weekly trading volume of Rio Tinto ADRs during the period of interest far exceeded benchmarks that courts have established. During the period of interest, the average weekly trading volume for Rio Tinto ADRs was 16.66 million shares, which represents 16.25% of shares outstanding, higher than the average security traded on the NYSE and/or the NASDAQ Exchange. Second, there were a large number of

[9] *Cammer,* 711 F. Supp. at 1276 n.17 (citing Bromberg & Lowenfels, 4 *Securities Fraud and Commodities Fraud*, § 8.6 (Aug. 1988) ("Bromberg & Lowenfels")).

securities analysts following and reporting on Rio Tinto. Third, Rio Tinto ADRs was actively traded on the NYSE, fulfilling the *Cammer* factor regarding market makers. Fourth, Rio Tinto met the important eligibility criteria of SEC Form F-3 (which has the same requirements as S-3 eligibility) and filed Form F-3ASRs during the period of interest. Fifth, Rio Tinto ADRs had a large market capitalization relative to all other firms that traded on the NYSE and NASDAQ. Sixth, Rio Tinto ADRs had a low bid-ask spread relative to exchange-traded common stocks. Seventh, institutions, which are considered generally to be well-informed investors, held on average over 79.84% of the remaining public float of Rio Tinto ADRs during the quarters of interest. Eighth, there was not a consistent pattern of statistically significant autocorrelation during the period of interest. Ninth, there was active trading in Rio Tinto options throughout the period of interest. Finally, tenth, there was very little divergence between the price of Rio Tinto ADRs and its underlying ordinary shares during the period of interest, indicating a lack of arbitrage opportunities. All of these factors support the conclusion that Rio Tinto ADRs traded in an open, developed, and efficient market throughout the period of interest.

B. FACTOR 1: AVERAGE WEEKLY TRADING VOLUME

10. The first factor I investigate is the average weekly trading volume of a security. According to one authority cited by the *Cammer* court,

> Turnover measured by average weekly trading of 2% or more of the outstanding shares would justify a strong presumption that the market for the security is an efficient one; 1% would justify a substantial presumption.[10]

11. Volume as a fraction of shares outstanding is an important indicator of market efficiency for several reasons. First, volume is objectively quantifiable and comparable across

[10] *Cammer*, 711 F. Supp. at 1293 (citing Bromberg & Lowenfels).

securities. Second, high volume is generally indicative of continuity, liquidity, and market depth – which are highly indicative of market efficiency.[11] Third, substantial volume would indicate there is likely a market for the collection and distribution of information about the security, as Thomas and Cotter (2000) explain:

> [t]rading volume was also considered as an eligibility standard because it affects information dissemination to the market and was an important criterion for investment analysts in deciding which stocks to follow."[12]

12. Rio Tinto ADRs easily surpass the threshold level of average weekly trading volume necessary for an efficient market. The average weekly trading volume for Rio Tinto ADRs during the period of interest was 16.25% of ADRs outstanding, compared to 2.98% for the average weekly trading volume on both the NYSE and NASDAQ exchanges. Based on this figure, the weekly trading volume for Rio Tinto ADRs far exceeds the 1% or 2% threshold cited by *Cammer*. **Exhibit C3** plots Rio Tinto ADRs' trading volume as a fraction of ADRs outstanding for each week during the period of interest.[13] Indeed, the average weekly trading volume during the period of interest was 16.66 million ADRs. The volume of trading for Rio

[11] Continuity means that trades may occur at any time. Liquidity in this context means that investors can convert cash into shares or shares into cash at a price similar to that of the prior trade (assuming no new information). William Sharpe, Gordon J. Alexander & Jeffrey W. Bailey, *Investments* (5th ed., 1999), Prentice Hall, pp. 44-45.

Bromberg and Lowenfels define a market that has continuity and liquidity as "the ability to absorb a reasonable amount of trading with relatively small price changes." *Cammer*, 1276 n.17 (citing Bromberg & Lowenfels).

Market depth refers to "the number of shares that [can] be traded at the quoted bid and ask prices." A deep market will have significant orders on the buy and sell side so that the market can experience a relatively large market order without greatly altering the market price. *See* Yakov Amihud, Haim Mendelson & Lasse Heje Pedersen, "Liquidity and Asset Prices," *Foundations and Trends in Finance* Vol. 1 (4), 2005, pp. 269-364.

[12] Randall S. Thomas & James F. Cotter, "Measuring Securities Market Efficiency in the Regulatory Setting," *Law and Contemporary Problems* Vol. 63 (3), 2000, pp. 105-122 at pp. 105, 108.

[13] For the purposes of this analysis, a "trading week" consists of 5 consecutive trading days, which may not follow the calendar week.

Tinto ADRs supports the conclusion that the market for this security was efficient throughout the period of interest.[14]

13. Another way to measure trading volume is annualized turnover velocity, which is essentially expressing this same factor in dollar terms.[15] To be more specific, instead of looking at shares traded divided by shares outstanding, turnover velocity is the dollar value of shares traded (*i.e.*, shares traded multiplied by price per share) divided by the dollar value of all shares outstanding (*i.e.,* shares outstanding multiplied by price per share). The advantage of this measure is that once quoted in annualized terms, Rio Tinto ADRs' turnover velocity can be compared directly with other publicly traded stocks based on exchange-reported statistics. For example, over the period of interest, the annualized turnover velocity ratio for Rio Tinto ADRs was 812.73% compared with the NYSE and NASDAQ average of 155.27% for the period of interest.[16] Thus, Rio Tinto ADRs had an average annualized turnover that was substantially higher than the average stock trading on the NYSE and NASDAQ, further supporting that it traded in an efficient market.

14. In short, the relatively high trading volume in Rio Tinto ADRs throughout the period of interest supports the conclusion that the market for Rio Tinto ADRs was efficient.

C. FACTOR 2: ANALYST COVERAGE

15. The *Cammer* decision stated the following related to analyst coverage:

> … [I]t would be persuasive to allege a significant number of securities analysts followed and reported on a company's stock during the period of

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[14] The last week consisted of only one trading day (1/17/2013), and therefore is removed from calculations.

[15] Turnover velocity as a formula is:

Turnover Velocity Ratio = (Volume x Price)/(Shares Outstanding x Price) = Dollars Traded/Dollars Outstanding.

[16] Turnover velocity for the NYSE and NASDAQ is calculated from data provided by the World Federation of Exchanges. *See* https://www.world-exchanges.org/our-work/statistics.

> interest. The existence of such analysts would imply, for example, the [analyst] reports were closely reviewed by investment professionals, who would in turn make buy/sell recommendations to client investors.[17]

16. Analyst coverage can be important evidence of efficiency. Significant analyst coverage implies that there is sufficient interest in a company and its securities, that there is an active market for information regarding the company and its securities, and that the information is widely distributed.

17. During the period of interest, there was consistent analyst coverage for Rio Tinto. **Exhibit C4** shows that there were at least 886 reports issued during the period of interest and lists 41 separate firms that had equity analysts issue reports on Rio Tinto, including major firms such as Deutsche Bank, J.P. Morgan, and RBC.[18] These reports served the purpose of disseminating publicly available information along with commentary, news, updates, analyses, and recommendations of the analysts to investors. The extensive coverage of Rio Tinto by securities analysts supports the conclusion that Rio Tinto ADRs traded in an efficient market throughout the period of interest.

18. In addition, since 1989, when the *Cammer* decision was issued, there has been a significant increase in alternative methods by which publicly available information about publicly-traded securities is disseminated to investors, such as myriad internet sites, social networks, and other electronic media, delivered directly to our phones and other hand-held devices from which investors can trade through various apps. Moreover, information regarding the market price, the current bid-ask spread, and the ability to trade online is available almost

[17] *Cammer*, 711 F. Supp. at 1286.

[18] I obtained Rio Tinto analyst reports from Investext which is a part of Thomson Reuters. Investext is a database that collects and disseminates analyst reports issued by investment banks and independent research firms. (*See* https://www.mergentonline.com/login.php). The number of analyst reports I identify is likely understated because many analyst reports are not available through third party data providers such as Investext.

instantaneously for anyone with an online brokerage account. Thus, in addition to the substantial analyst coverage of Rio Tinto, there were many other sources of public information dissemination.

19. Furthermore, there was substantial public press regarding Rio Tinto during the period of interest. A search for articles classified by Factiva as related to Rio Tinto over the period of interest resulted in 32,245 articles, which averages to more than 41 per day.[19] In addition, there were numerous SEC filings available online at the SEC EDGAR search database at no cost, as well as various other sources of public information available that I do not attempt to quantify. The degree of news coverage and publicly available information further supports the conclusion that there was substantial supply of, and demand for, information regarding Rio Tinto in the public arena throughout the period of interest.

20. In summary, the number of analyst reports and the substantial public dissemination of news and other information regarding Rio Tinto provides evidence that Rio Tinto ADRs traded in an efficient market during the period of interest.

D. FACTOR 3: MARKET MAKERS

21. A market maker is a firm that is ready to buy or sell a particular stock on a regular and continuous basis.[20] The third *Cammer* factor[21] is based on the premise that the number of

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[19] Factiva is a business information and research tool owned by Dow Jones & Company. Factiva aggregates content from both licensed and free sources, and provides organizations with search, alerting, dissemination, and other information management capabilities. The 32,245 unique articles for the period of interest (December 1, 2010 – January 17, 2013) were identified as a result of a search for "All Sources" with the company fields "Rio Tinto plc," "Rio Tinto ltd," and "Rio Tinto Group." I acknowledge that this may not reflect all news as the Factiva database is limited to certain sources and content type. Note also that limiting the search to only US publications results in 4,426 articles over the same time period, which is more than 5 per day on average.

[20] *See* http://www.sec.gov/answers/mktmaker.htm.

[21] *Cammer*, 711 F. Supp. at 1293.

market makers can serve as an efficiency criterion for securities traded "over-the-counter" because market makers have knowledge about the supply and demand of shares and facilitate price discovery.[22]

22. Rio Tinto ADRs traded on a major exchange (*i.e.*, NYSE) with continuous public price and volume reporting, as opposed to an over-the-counter market without volume reporting, which is the context in which *Cammer* indicated this was a relevant criterion.[23] While over-the-counter markets may have reasons for concern regarding liquidity and information dissemination, such concerns are generally not applicable to securities trading on large, modern exchanges such as the NYSE and NASDAQ, which are presumed to be efficient, report volume and trade details, and tend to have rules that virtually guarantee a liquid market.[24]

23. The NYSE and NASDAQ are two of the largest and most liquid security exchanges in the world with billions of shares traded each day. Unlike over-the-counter markets that rely on decentralized market makers providing liquidity for trading, the NYSE and NASDAQ rely on computerized systems to match orders and provide quotes.[25] The minimum requirements to be listed on the NYSE or NASDAQ and remain in good standing virtually guarantee a liquid market

[22] Brad M. Barber, Paul A. Griffin & Baruch Lev, "The Fraud-on-the-Market Theory and the Indicators of Common Stocks' Efficiency," *The Journal of Corporation Law*, 1994.

[23] *See Cammer,* 711 F. Supp. at 1292, citing Bromberg & Lowenfels: "We think that, at a minimum, there should be a presumption – probably conditional for class determination – that certain markets are developed and efficient for virtually all the securities traded there: the New York and American Stock Exchanges, the Chicago Board Options Exchange and the NASDAQ National Market System."

[24] For example, there are rules for minimal market capitalization and specialists are *required* to maintain an orderly market; s*ee Section 102* http://wallstreet.cch.com/LCM/Sections/. *See also*, William Sharpe, Gordon J. Alexander & Jeffrey W. Bailey, *Investments* (5th ed., 1995), Prentice Hall, pp. 45-53; Frank J. Fabozzi, Franco Modigliani & Frank J. Jones, *Foundations of Financial Markets and Institutions* (4th ed., 2010), Prentice Hall, Chapter 18 – Appendix A.

[25] For NYSE, *see* https://www.nyse.com/market-model. For NASDAQ*, see* https://www.nasdaqtrader.com/Trader.aspx?id=TradingUSEquities.

for that security. Therefore, the number of "market makers" is not in itself a particularly relevant metric in this case, but the intent of this factor is satisfied.

E. FACTOR 4: SEC FORM S-3 ELIGIBILITY

24. *Cammer* states:

> …[I]t would be helpful to allege the Company was entitled to file an S-3 Registration Statement in connection with public offerings or, if ineligible, such ineligibility was only because of timing factors rather than because the minimum stock requirements set forth in the instructions to Form S-3 were not met. Again, it is the number of shares traded and value of shares outstanding that involve the facts which imply efficiency.[26]

25. Through Form S-3 (and Form F-3 with respect to foreign issuers),[27] the SEC allows certain companies which have previously provided sufficiently high levels of public information to incorporate prior SEC filings by reference into current filings and not repeat the information, since it is deemed to be widely publicly available.[28] In order to be eligible to issue a Form S-3 or Form F-3, among other things, a company 1) must be subject to the Securities Exchange Act of 1934 reporting requirements for more than one year, 2) must have filed all documents in a timely manner for the past twelve months, and 3) must show that it has not failed to pay dividends or sinking funds or defaulted on debts or material leases. Eligibility to file a Form F-3 is confirmatory evidence of efficiency, not a requirement.

26. Rio Tinto clearly met the eligibility requirements because prior to and during the period of interest, Rio Tinto filed SEC Form F-3ASR, which can be thought of as a fast-track Form F-3 for well-known issuers.[29] "ASR" stands for "automatic shelf registration" and allows a

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[26] *Cammer*, 711 F. Supp. at 1287.

[27] https://www.sec.gov/files/formf-3.pdf

[28] For additional information, *see* www.sec.gov/about/forms/forms-3.pdf.

[29] Rio Tinto filed F-3ASRs on June 23, 2008 and June 21, 2011. After the period of interest Rio Tinto also filed an F-3ASR on June 12, 2014.

company to register unspecified amounts of different specified types of securities using a single form.

27. Thus, Rio Tinto met the SEC's F-3ASR standards as a seasoned issuer for which information is already widely distributed, a fact that supports the conclusion that the Rio Tinto ADRs traded in an efficient market.

F. FACTOR 5: MARKET CAPITALIZATION

28. The *Krogman* Court held that "[m]arket capitalization, calculated as the number of shares multiplied by the prevailing share price, may be an indicator of market efficiency because there is a greater incentive for stock purchasers to invest in more highly capitalized corporations."[30] Furthermore, firms with a larger market capitalization tend to have larger institutional ownership, be listed on a major exchange, and have greater analyst coverage.[31] Therefore, market capitalization is likely correlated with efficiency.

29. Rio Tinto ADRs had higher market capitalization than the majority of NYSE and NASDAQ stocks during the period of interest, thus this factor is supportive of efficiency. There were between 89.1 million and 108.9 million shares of Rio Tinto ADRs outstanding throughout the period of interest.[32] **Exhibit C5** shows Rio Tinto's market capitalization over the period of interest. According to my analysis, the market capitalization for Rio Tinto ADRs averaged $5.87 billion over this time frame. **Exhibit C6** shows that during the period of interest, Rio Tinto ADRs market capitalization ranged from the 86th to 90th percentile of the combined NYSE and

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[30] *Krogman*, 202 F.R.D. at 478.

[31] Randall S. Thomas & James F. Cotter, "Measuring Securities Market Efficiency in the Regulatory Setting," *Law and Contemporary Problems* Vol. 63 (3), 2000, pp. 105-122 at p. 117.

[32] Bloomberg; Rio Tinto Annual Reports 2010-2014; *See* Exhibit C8.

NASDAQ markets for the applicable quarters during the period of interest.[33] In other words, over the period of interest, Rio Tinto ADRs had a higher market capitalization than at least 86% of the firms on the combined NYSE and NASDAQ.

30. Given that the market capitalization for Rio Tinto ADRs was consistently large relative to other publicly traded companies, this factor is supportive of market efficiency.

G. FACTOR 6: THE BID-ASK SPREAD

31. The *Krogman* court stated that "[a] large bid-ask spread is indicative of an inefficient market, because it suggests that the stock is too expensive to trade."[34] The bid-ask spread is an important indicator of the degree to which a market is developed. The bid-ask spread represents a measure of the cost to transact in a market. Narrow bid-ask spreads indicate less uncertainty regarding valuation and that reasonably sized trades will not substantially impact the market price. Wider bid-ask spreads indicate greater liquidity costs and less ability to trade without moving the market price. In addition, the wider the bid-ask spread, the more costly it is to arbitrage away small inefficiencies. Thus, the narrower the bid-ask spread, the greater indication of an efficient market.[35]

32. I analyzed bid-ask spreads for Rio Tinto ADRs during the period of interest. **Exhibit C7** shows that during this period, the time-weighted average percentage bid-ask spread

[33] Bloomberg EQS Function.

[34] *Krogman*, 202 F.R.D. at 478.

[35] Yakov Amihud, Haim Mendelson & Lasse Heje Pedersen, "Liquidity and Asset Prices," *Foundations and Trends in Finance* Vol. 1 (4), 2005, pp. 269-364; Yakov Amihud & Haim Mendelson, "Asset Pricing and the Bid-Ask Spread," *Journal of Financial Economics* Vol. 17, 1986, pp. 223-249; Hendrik Bessembinder, "Trade Execution Costs and Market Quality after Decimalization," *Journal of Financial and Quantitative Analysis* Vol. 38 (4), 2003, pp. 747-777.

for Rio Tinto ADRs in each month was between 0.016% and 0.046%.[36] This is well below the average and median bid-ask spread of a random sample of 100 common stocks trading on the NYSE and NASDAQ in August 2011 (the full month during the period of interest when Rio Tinto had its largest percentage bid-ask spread).[37, 38] **Exhibit C7** demonstrates that Rio Tinto ADRs had a monthly average bid-ask spread of 0.046% in August 2011, while a randomly selected group of 100 common stocks on the NYSE and NASDAQ had an average bid-ask spread of 2.85%. Accordingly, Rio Tinto ADRs bid-ask spread was low during the period of interest, further indication that Rio Tinto ADRs traded in an efficient market.

H. FACTOR 7: FLOAT AND INSTITUTIONAL OWNERSHIP

33. The *Krogman* court also looked at institutional ownership as signs of efficiency. Institutional investors are considered to be sophisticated and well-informed with access to most publicly available information for the securities that they own. These investors include mutual funds, pension funds, investment banks, and other types of large financial institutions that have substantial resources to analyze the securities they purchase for their portfolios. As **Exhibit C8** shows, 702 institutions reported owning Rio Tinto ADRs during the period of interest, holding

[36] The time-weighted average bid-ask spread was calculated by taking the average of the spread during trading hours on the primary exchange of each security, weighted by the amount of time each quote prevails in the market. That is, I take the weighted average quote, with the weight being the number of seconds between that quote and the next quote that occurs. Spread is calculated as the difference between the bid price and ask price divided by the midpoint of the bid-ask spread. I calculated the National Best Bid and Offer using the data filtering procedures described in Roger D. Huang & Hans R. Stall, "Dealer Versus Auction Markets: A Paired Comparison of Execution Costs on NASDAQ and the NYSE," *Journal of Financial Economics* Vol. 41, 1996, pp. 313-357.

[37] Quote data for Rio Tinto ADRs and other publicly traded stocks were obtained from the TICK database. *See* https://tickapi.tickdata.com/.

[38] I constructed a random sample because I am not aware of any exchange-wide reporting of average or median bid-ask spreads. Determining the average bid-ask spread for the entire market would be a very costly and data intensive process, therefore I adopted a random sampling methodology. I determined the constituents of the NYSE and NASDAQ for August 2011 and then randomly generated a list of 100 common stock securities. I then calculated the time-weighted average monthly bid-ask spread for August 2011.

virtually the entirety of the public float. This substantial level of institutional ownership of Rio Tinto ADRs during the period of interest further supports a conclusion of market efficiency.

I. FACTOR 8: AUTOCORRELATION

34. If previous price changes of a security have the ability to predict future price changes, then returns are said to be "autocorrelated." Autocorrelation is relevant to efficiency because if the autocorrelation is persistent and sufficiently large that a trader could profit from taking advantage of the autocorrelation, it means that past price movements are not fully reflected in the current price, which would suggest market inefficiency.

35. Autocorrelation may occur from time to time for random reasons or due to the pattern of firm-specific news. Inefficiency would only be indicated, however, if the autocorrelation were large enough and persistent enough that a trader could consistently earn riskless profits over time.[39]

36. A well-accepted methodology to test for the existence of autocorrelation is to run a regression analysis that tests whether, on average, the abnormal return from the previous day has a statistically significant effect on the abnormal return today.[40] If the previous day's abnormal return has no statistically significant predictive power, then there is no evidence of autocorrelation.

37. **Exhibit C9** displays the autocorrelation coefficient for Rio Tinto ADRs for the period of interest using the abnormal returns from the event study model I described in my

[39] Doron Avramov, Tarun Chordia & Amit Goyal, "Liquidity and Autocorrelations in Individual Stock Returns," *The Journal of Finance* Vol. 61 (5), 2006, pp. 2365-2394 at pp. 2365, 2367-68; Michael C. Jensen, "Some Anomalous Evidence Regarding Market Efficiency," *Journal of Financial Economics* Vol. 6 (2/3), 1978, pp. 95-101.

[40] William H. Greene, *Econometric Analysis* (6th ed., 2008), Prentice Hall, p. 644.

report. The coefficient for the full period of interest is not statistically different from zero, meaning there is no evidence of autocorrelation in the trading of Rio Tinto ADRs during this period.[41] **Exhibit C9** also presents results of tests of autocorrelation within quarters, and shows that there is one statistically significant coefficient. Further analysis shows that removing the abnormal return of just one date, June 8, 2012, results in finding no evidence of autocorrelation for that quarter. On June 8, 2012 my event study finds a large negative abnormal return, while the day before has a large positive abnormal return, and it is this swing that appears to be driving the statistically significant autocorrelation for the quarter. Without this single swing, the results are consistent with the notion that an investor could not consistently predict, from past price changes alone, abnormal movements and earn arbitrage profits in any quarter during the period of interest. Therefore, this factor also supports the conclusion that Rio Tinto ADRs traded in an efficient market throughout the period of interest.

J. FACTOR 9: OPTIONS

38. In addition to the factors analyzed above, there was also considerable option trading in Rio Tinto ADRs during the period of interest.[42] Academic articles have demonstrated that options written on existing assets can improve efficiency by permitting an expansion of the contingencies that are covered by the market.[43] Empirical analysis has shown that option listings are associated with a decrease in bid-ask spread and increase in quoted depth, trading volume, trading frequency, and transaction size – an overall improvement of the market quality of the

[41] Exhibit C9 shows that over a longer time horizon the autocorrelation coefficient was close to zero, not statistically significant, and switched from positive to negative and vice versa on multiple occasions. These results are not consistent with investors being able to arbitrage and earn riskless profits as a result of autocorrelation.

[42] According to Bloomberg, there were 985,924 Rio Tinto PLC ADR put contracts and 1,375,468 Rio Tinto PLC ADR call contracts that traded during the period of interest.

[43] Stephen A. Ross, "Options and Efficiency," *The Quarterly Journal of Economics* Vol. 90, 1976, pp. 75-89.

underlying stocks.[44] Thus, this factor also supports that Rio Tinto ADRs traded in an efficient market throughout the period of interest.

K. FACTOR 10: LACK OF ARBITRAGE OPPORTUNITY

39. As I discussed in my report, throughout the period of interest, Rio Tinto common stock was listed on the Australian Securities Exchange and the London Stock Exchange.[45] In an efficient market, one would expect related securities such as these to move in tandem in the marketplace after taking into account the conversion ratio and exchange rate. If, by contrast, the securities did not trade in tandem, then there would opportunities for arbitrage, which is defined as the "exploitation of security mispricing in such a way that risk-free economic profits may be earned."[46] Arbitrage involves the simultaneous purchase and sale of equivalent securities in order to profit from discrepancies in their price relationship. As shown in **Exhibit C10**, however, it is quite clear that there was very little divergence between the prices Rio Tinto ADRs and its underlying ordinary shares traded in London during the period of interest. This further supports my view that Rio Tinto ADRs traded in an efficient market.

III. CONCLUSION

40. In sum, every factor analyzed supports my opinion that Rio Tinto ADRs traded in an efficient market during the period of interest.

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[44] Raman Kumar, Atulya Sarin & Kuldeep Shastri, "The Impact of Options Trading on the Market Quality of the Underlying Security: An Empirical Analysis," *The Journal of Finance* Vol. 53 (2), 1998, pp. 717-732.

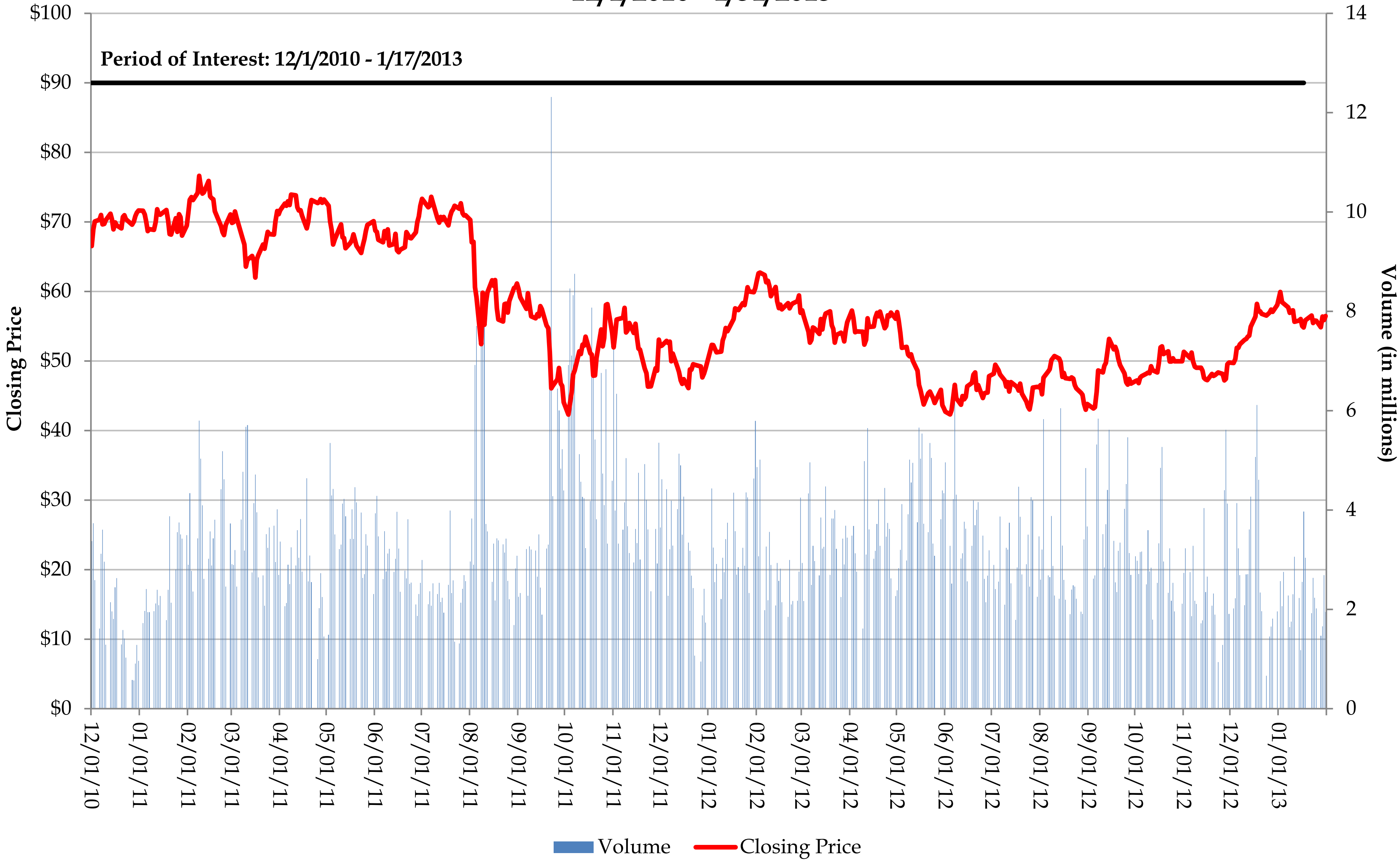
[45] 2010-2014 Rio Tinto Annual Reports.

[46] Zvi Bodie, Alex Kane, & Alan J. Marcus, *Investments* (4th ed., 1999), Irwin McGraw-Hill, p. 307.

Exhibit C1
Summary of Efficiency Factors for Rio Tinto

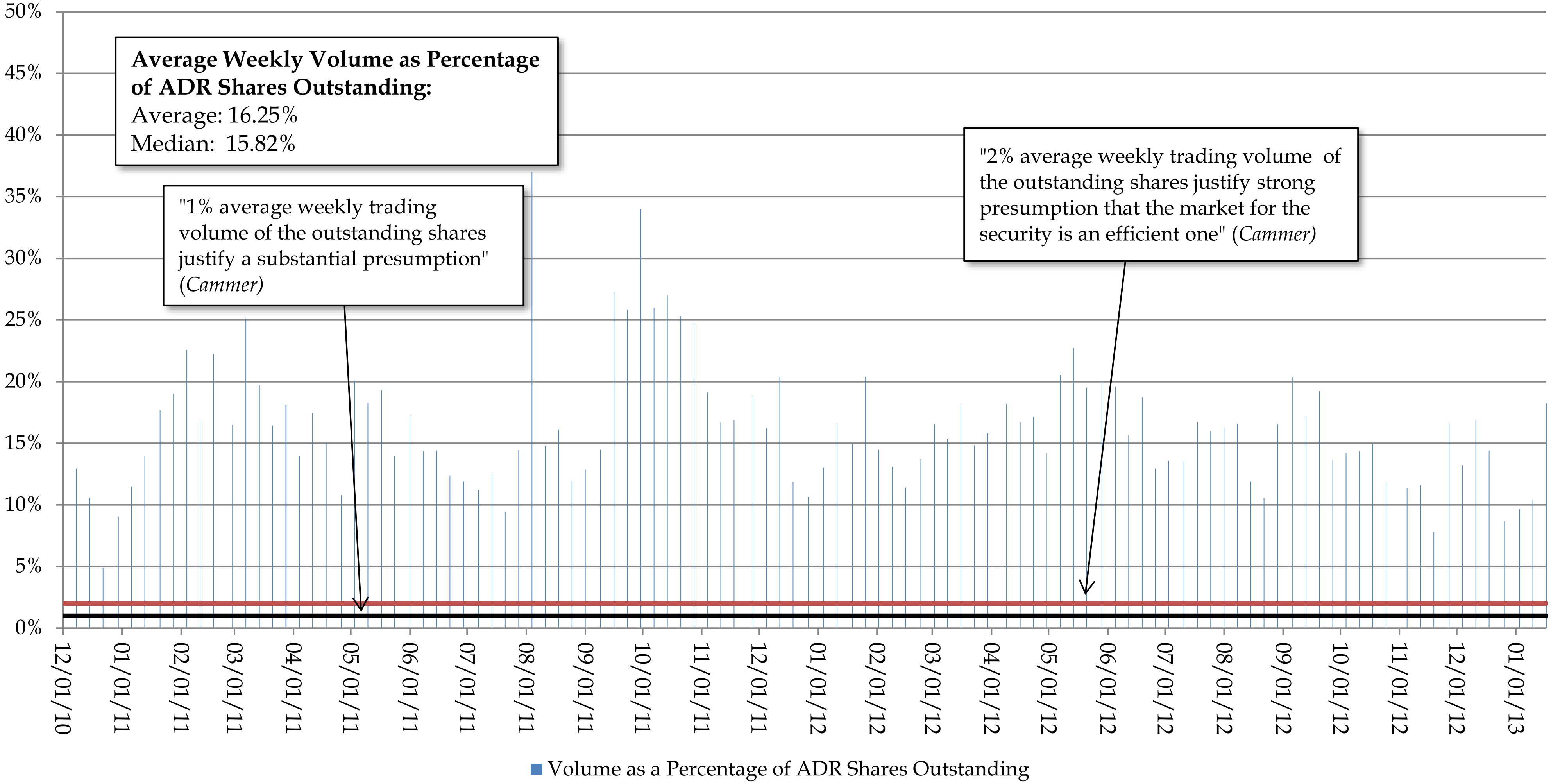
Factor	Summary of Factor	Rio Tinto
Average Weekly Trading Volume	"Turnover measured by average weekly trading of 2% or more of the outstanding shares would justify a strong presumption that the market for a security is an efficient one; 1% would justify a substantial presumption."	• The average weekly trading volume of 16.25%, as a percentage of ADRs outstanding, exceeds the standard of 2% that courts have suggested would justify a strong presumption of an efficient market (Note: 16.66 million ADRs traded weekly on average during the period of interest).
Analyst Coverage	"…it would be persuasive to allege a significant number of securities analysts followed and reported on a company's stock during the class period. The existence of such analysts would imply, for example, the [auditor] reports were closely reviewed by investment professionals, who would in turn make buy/sell recommendations to client investors."	• During the period of interest, at least 41 securities analysts issued 886 analyst reports which implies that important information relevant to trading Rio Tinto ADRs was widely communicated to the market.
Market Makers	"For over the counter markets without volume reporting, the number of market makers is probably the best single criterion. Ten market makers for a security would justify a substantial presumption that the market for the security is an efficient one; five market makers would justify a more modest presumption."	• Because Rio Tinto ADRs were exchange-traded on the NYSE during the period of interest, not over the counter, this factor is satisfied.
SEC Form S-3 Eligibility	"It would be helpful to allege the Company was entitled to file an S-3 Registration Statement in connection with public offerings or, if ineligible, such ineligibility was only because of timing factors rather than because the minimum stock requirements set forth in the instructions to Form S-3 were not met. Again, it is the number of shares traded and value of shares outstanding that involve the facts which imply efficiency."	• Rio Tinto filed a Form F-3ASR before, during, and after the period of interest (on June 23, 2008; June 21, 2011; and June 12, 2014). I have found no evidence to believe that Rio Tinto was not F-3 eligible throughout the period of interest, thus satisfying this factor.
Market Capitalization	Firms with a larger market capitalization tend to have "larger institutional ownership and tend to be listed on the New York Stock Exchange with a greater analyst following."	• As of 12/31/2010 and 12/31/2012, Rio Tinto ADR market capitalization was $6.62 billion and $6.32 billion, respectively, which is at least the 86th percentile of all NYSE and NASDAQ stocks. Rio Tinto ADR therefore easily meets this criterion.
Bid-Ask Spread	The bid-ask spread represents a measure of the cost to transact in a market. Narrow bid-ask spreads indicate less uncertainty regarding valuation and that reasonably sized trades will not substantially impact the market price. Wider bid-ask spreads indicate greater liquidity costs and less ability to trade without moving the market price.	• During the period of interest, the average percentage bid-ask spread for Rio Tinto ADRs in each month ranged from 0.016% to 0.046%. Rio Tinto's average percentage bid-ask spread was well below the mean and median bid-ask spread of a random sample of 100 common stocks trading on the NASDAQ and NYSE in August 2011 (the full month when Rio Tinto had the largest bid-ask spread). This supports a finding of efficiency.
Float and Institutional Ownership	Institutional investors are considered to be sophisticated, well-informed investors with access to most publicly available information for the stocks that they own.	• 702 institutions held the vast majority of the public float throughout the period of interest which further supports the finding that Rio Tinto ADRs traded in an efficient market.
Autocorrelation	If autocorrelation is persistent and sufficiently large that a trader could profit from taking advantage of the autocorrelation, it suggests market inefficiency because past price movements are not fully reflected in the current price.	• There was not a consistent pattern of statistically significant autocorrelation during the period of interest, which means that there was no systematic opportunity for a trader to profit from trading Rio Tinto ADRs based solely on its past price movements. This supports a finding of efficiency.
Options	Empirical analysis has shown that option listings are associated with a decrease in bid-ask spread and increase in quoted depth, trading volume, trading frequency, and transaction size – an overall improvement of the market quality of the underlying stocks.	• There were 985,924 Rio Tinto ADR put contracts and 1,375,468 Rio Tinto ADR call contracts that traded during the period of interest. Rio Tinto ADRs therefore easily meets this criterion.
Lack of Arbitrage Opportunity	In an efficient market, one would expect related securities to move in tandem in the marketplace after taking into account the conversion ratio and exchange rate.	• It is clear that there was very little divergence between the prices of Rio Tinto ADRs and its underlying ordinary shares traded in London during the period of interest.

Exhibit C2
Rio Tinto ADR Price & Volume
12/1/2010 - 1/31/2013



Sources: Complaint and S&P Capital IQ.

Exhibit C3
Rio Tinto ADR Average Weekly Trading Volume
as a Percentage of ADR Shares Outstanding
12/1/2010 - 1/17/2013



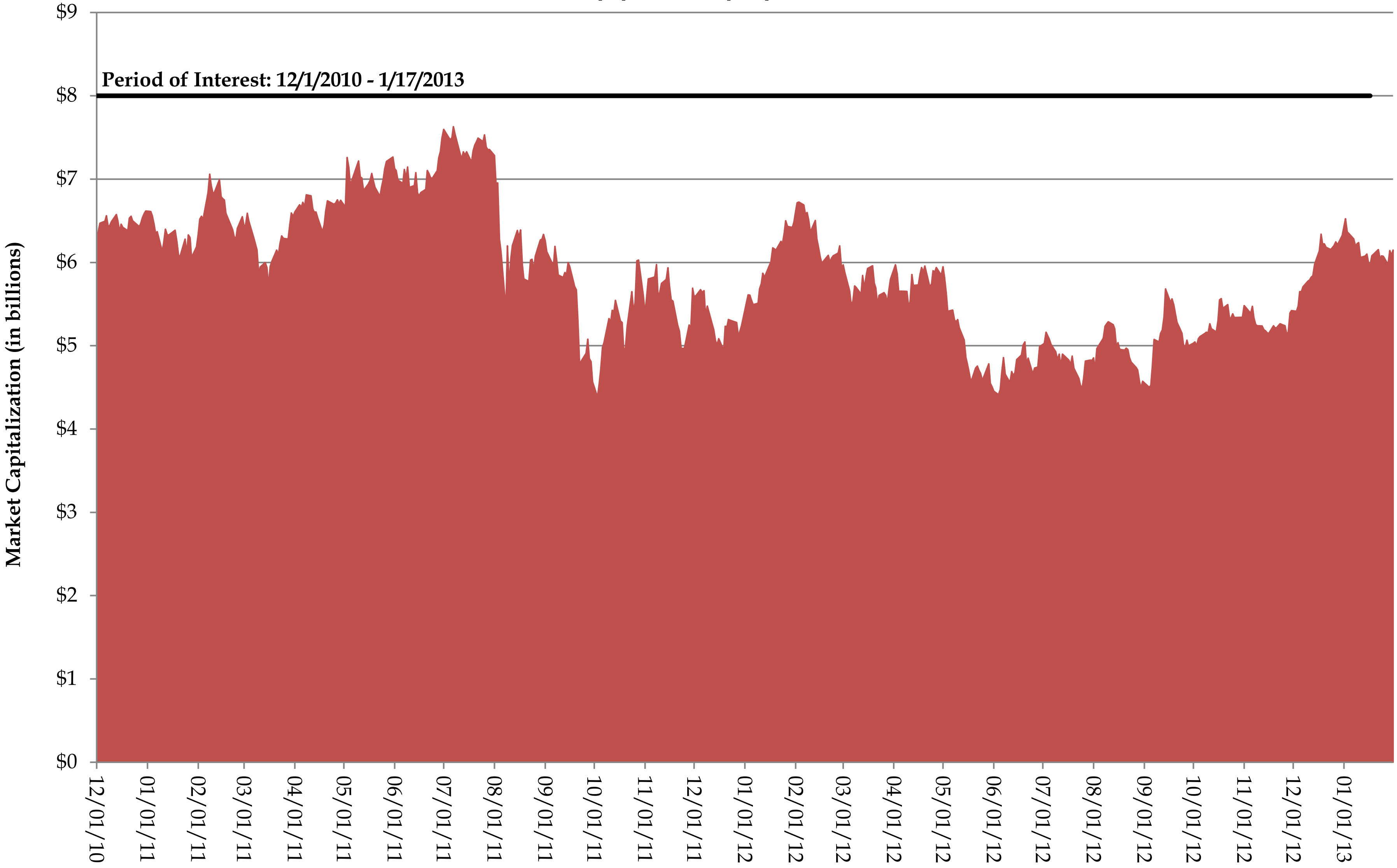
Source: S&P Capital IQ and Bloomberg.
Note: Average weekly trading volume is calculated by analyzing each five consecutive trading days (rather than calendar weeks) starting with the first day of the period of interest on December 1, 2010 through January 17, 2013. The last week consisted of only one trading day (1/17/2013), and therefore is removed from calculations.

Exhibit C4
Summary of Securities Analyst Reports Issued for Rio Tinto ADR

	Analyst Name	Reports Issued During the Period of Interest: 12/1/2010 - 1/17/2013
[1]	DEUTSCHE BANK	106
[2]	UBS RESEARCH	103
[3]	JPMORGAN	83
[4]	LIBERUM	52
[5]	CREDIT SUISSE	48
[6]	RBC CAPITAL MARKETS (CANADA)	46
[7]	MACQUARIE RESEARCH	43
[8]	NATWEST MARKETS	42
[9]	MORGAN STANLEY	37
[10]	BMO CAPITAL MARKETS	35
[11]	SOCIETE GENERALE	34
[12]	MORNINGSTAR, INC.	32
[13]	COWEN SECURITIES	29
[14]	CANACCORD GENUITY	28
[15]	SADIF ANALYTICS	23
[16]	GLOBALDATA	20
[17]	EL&C BAILLIEU	15
[18]	WRIGHT INVESTORS SERVICE	13
[19]	NOMURA INTERNATIONAL (HONG KONG) LTD.	11
[20]	INVESTEC BANK (UK) PLC	10
[21]	MARKETLINE (A DATAMONITOR COMPANY) - COMPANY RESEARCI	10
[22]	CFRA EQUITY RESEARCH	9
[23]	NATIXIS	8
[24]	TREFIS	7
[25]	JEFFERIES	6
[26]	HSBC GLOBAL RESEARCH	5
[27]	RBS (DESK STRATEGY)	5
[28]	CGS-CIMB RESEARCH	4
[29]	CHARLES STANLEY & CO., LTD.	4
[30]	MF GLOBAL	3
[31]	BARCLAYS	2
[32]	DOLMEN SECURITIES	2
[33]	EVOLUTION SECURITIES	2
[34]	REDBURN (EUROPE) LIMITED	2
[35]	COLLINS STEWART EUROPE	1
[36]	DATAMONITOR - COMPANY RESEARCH	1
[37]	HARDMAN & COMPANY	1
[38]	ICD RESEARCH - COMPANY SWOT	1
[39]	RENAISSANCE CAPITAL	1
[40]	SP ANGEL	1
[41]	STERNEAGEE CRT	1
	Total	**886**

Source: Investext.
Note: Many analyst reports are not available through third party data providers (e.g. Investext); therefore, this almost certainly understates the total amount of analyst coverage.

Exhibit C5
Rio Tinto ADR Market Capitalization
12/1/2010 - 1/31/2013



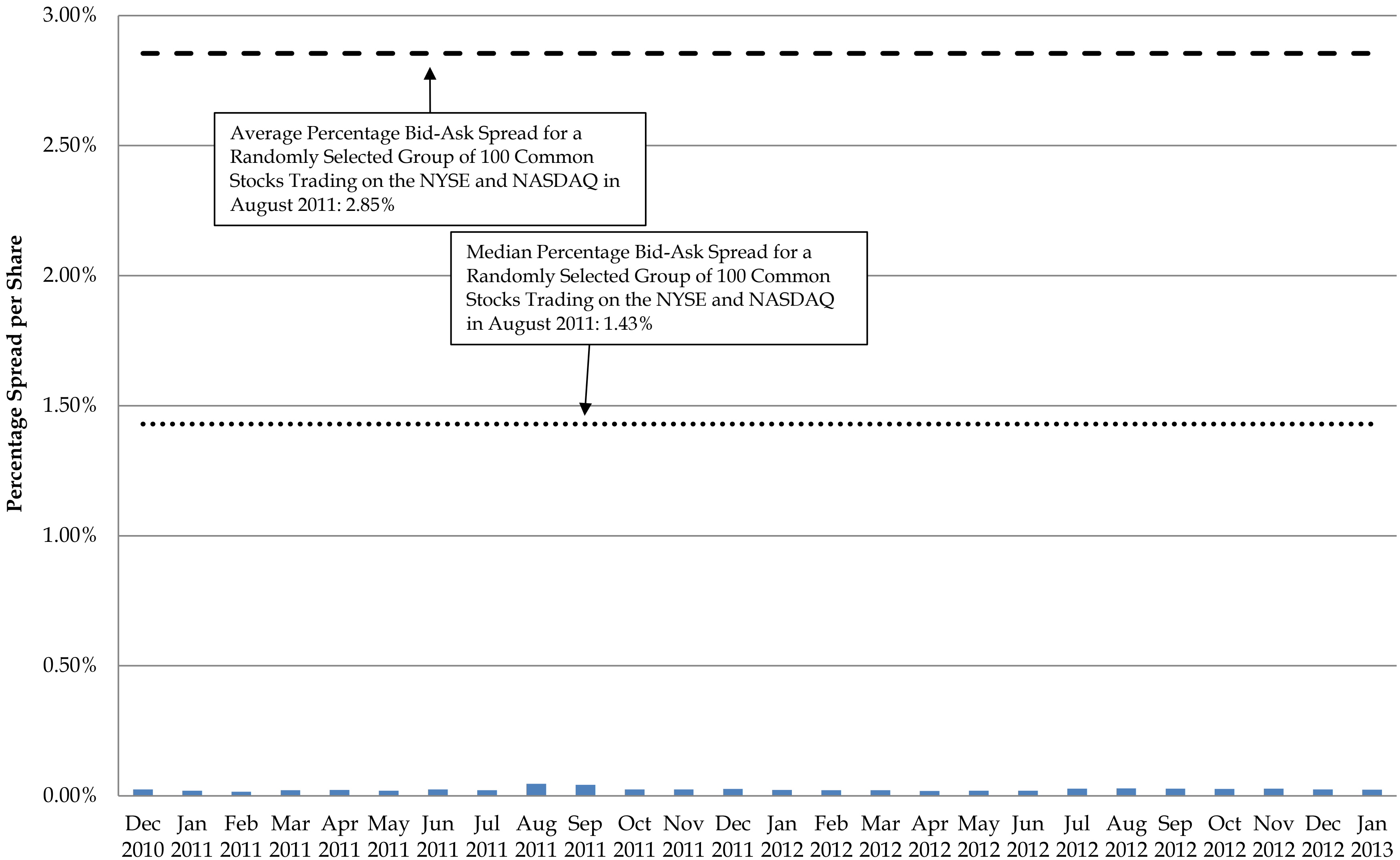
Sources: Complaint, Bloomberg, and S&P Capital IQ.

Exhibit C6
Rio Tinto ADR
Market Capitalization Rankings

Last trading day of:	Market Capitalization (billions)	Percentile Rank on NYSE & NASDAQ
Q4 2010	$6.62	89%
Q1 2011	$6.55	89%
Q2 2011	$7.49	90%
Q3 2011	$4.57	88%
Q4 2011	$5.25	88%
Q1 2012	$5.80	87%
Q2 2012	$4.99	87%
Q3 2012	$5.00	86%
Q4 2012	$6.32	88%

Source: Bloomberg and S&P Capital IQ.

Exhibit C7
Rio Tinto ADR Average Monthly Bid-Ask Percentage Spread
12/1/2010 - 1/17/2013



Source: Thomson Reuters Eikon and TICK Data.
Note: January 2013 data is limited to the period of interest.

Exhibit C8
Rio Tinto ADR Shares Outstanding and Institutional Holdings

Date [1]	Total Number of ADRs Held (in 000s) [2]	Number of Institutions Owning ADRs [3]	Short Interest (in 000s) [4]	Public Float (in 000s) [5] = [2] + [4]	Total Institutional Holdings (in 000s) [6]	Institutional Holdings % of Total ADRs [7] = [6] / [2]	Institutional Holdings % of Public Float [8] = [6] / [5]
12/31/2010	92,351	380	4,043	96,394	82,977	90%	86%
3/31/2011	92,125	405	5,345	97,470	88,146	96%	90%
6/30/2011	103,617	407	7,153	110,770	88,141	85%	80%
9/30/2011	103,617	394	7,451	111,068	87,189	84%	79%
12/31/2011	107,233	414	11,274	118,507	90,343	84%	76%
3/31/2012	104,283	409	10,823	115,107	90,583	87%	79%
6/30/2012	104,316	369	12,410	116,726	87,368	84%	75%
9/30/2012	106,849	367	12,223	119,073	92,469	87%	78%
12/31/2012	108,865	386	13,383	122,249	93,587	86%	77%
Total Institutions over the Period of Interest:		**702**		**Average over the Period of Interest:**		**86.90%**	**79.84%**

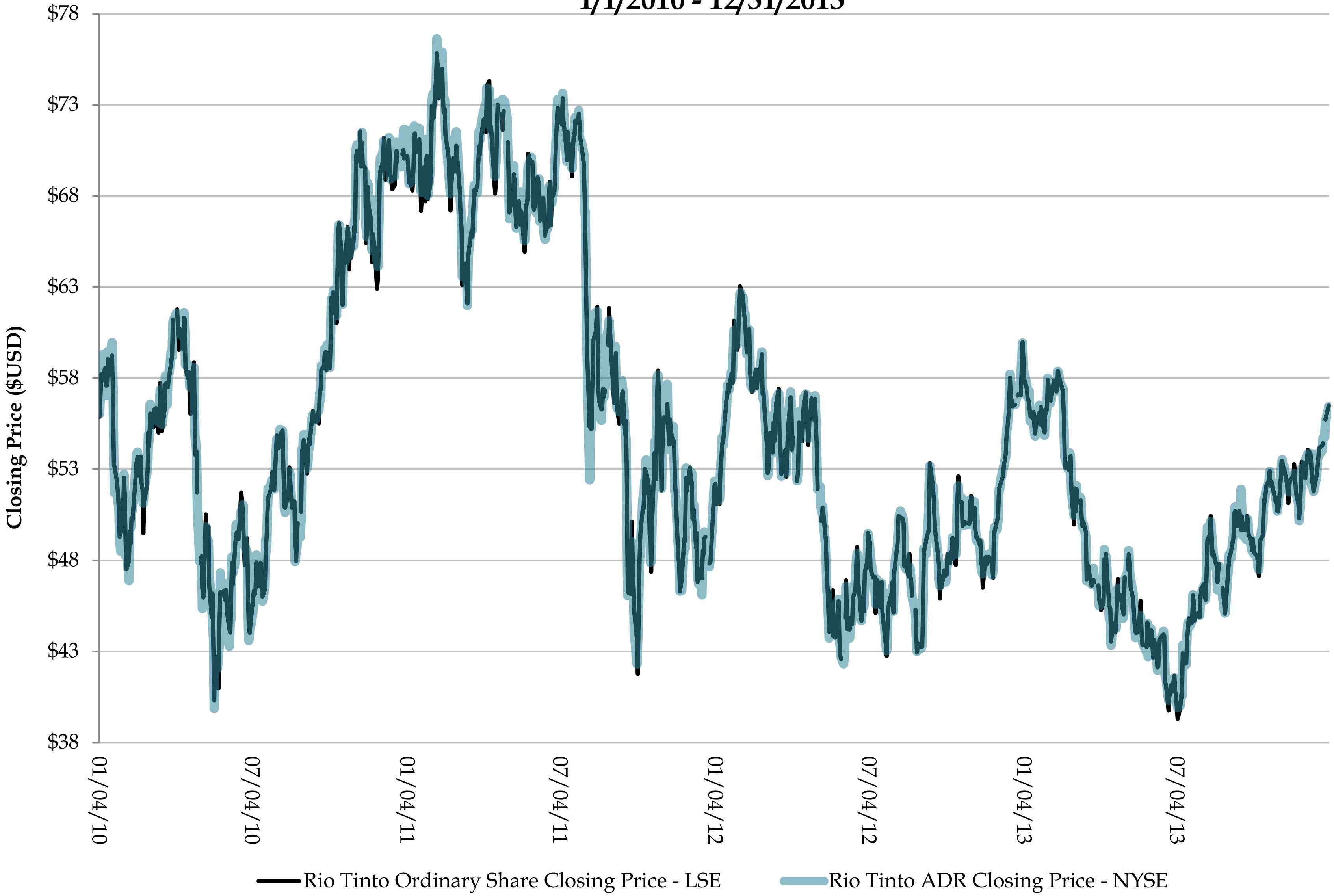
Sources: S&P Capital IQ and Bloomberg.

Exhibit C9
Rio Tinto ADR
Test for Autocorrelation During the Period of Interest

Quarter	Coefficient on Previous Day's Abnormal Return	t-Statistic	Sig Level
Q4 2010	-0.04	-0.18	
Q1 2011	-0.05	-0.35	
Q2 2011	-0.02	-0.13	
Q3 2011	-0.06	-0.48	
Q4 2011	0.20	1.59	
Q1 2012	0.05	0.42	
Q2 2012	-0.36	-3.02	***
Q3 2012	-0.09	-0.70	
Q4 2012	-0.01	-0.10	
Q1 2013	-0.11	-0.35	
Period of Interest	**-0.02**	**-0.51**	

Source: S&P Capital IQ.
Note: For each quarter, I perform a regression with the abnormal return from the event study as the dependent variable and the previous day's abnormal return as the independent variable.

Exhibit C10
Daily Closing Price of Rio Tinto ADR (NYSE) and Ordinary Share (LSE) in Dollars
1/1/2010 - 12/31/2013



Sources: Complaint and S&P Capital IQ.